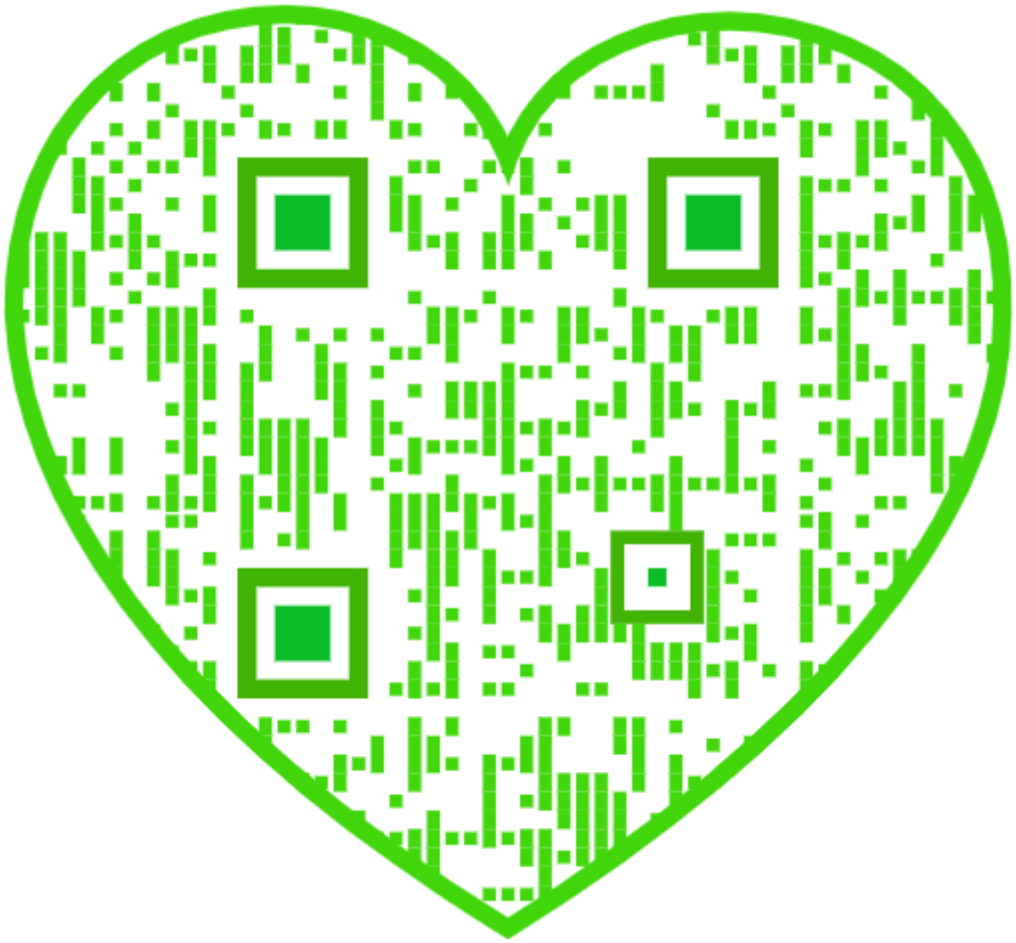

The
LUMBER INSPECTION RULES

Containing rules governing the manufacture and inspection of the different kinds of lumber, weights of lumber, comparative strength of building timbers and other information useful to the buyer and consumer of lumber.

COMPILED BY
S. C. STAILEY

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YELLOW PINE INSPECTION RULES

Known as The Interstate Rules of 1905

Approved in conference of committees from The New York Yellow Pine Exchange, The New York Lumber Trade Association, The Philadelphia Lumbermen's Exchange, The Baltimore Lumberman's Exchange, The South Carolina Lumber Association, and The Georgia Inter-State Saw Mill Association, December 10th, 1904.

Adopted by The New York Lumber Trade Association; The Georgia Inter-State Saw Mill Association; The Yellow Pine Exchange of New York; The Philadelphia Lumbermen's Exchange; Lumber Exchange of Baltimore.

As the Official Rules of those respective Associations; effective after February 1.

GENERAL RULES

All lumber must be sound, commercial long leaf yellow pine (pine combining large coarse knots with coarse grain is excluded under these rules), well manufactured, full to size and saw butted, and shall be free from the following defects—unsound, loose and hollow knots, worm holes and knot holes, through shakes or round shakes that show on the surface; and shall be square edge unless otherwise specified.

A through shake is hereby defined to be through or connected from side to side, or edge to edge, or side to edge.

In the measurement of dressed lumber the width and thickness of the lumber before dressing must be taken—less than one inch thick shall be measured as one inch.

The measurement of wane shall always apply to the lumber in the rough.

"All lumber grading higher than the grade for which it is sold shall be accepted as of the grade sold."

*Resolved, That the rules of inspection for Long Leaf Yellow Pine lumber, as formed at Savannah and amended at New York, and known as the 1905 rules, be reaffirmed by this meeting; but with the understanding that the first paragraph of the General Rules is not to be construed to admit Short Leaf Pine in Long Leaf shipments.

---

*The Georgia-Florida Saw Mill Association in lieu of this clause adopted the following:

Resolved, That it is the sense of this Association that Short Leaf Pine should never be shipped by a member of this Association on orders calling for Long Leaf Pine.

CLASSIFICATION

Flooring

Flooring shall embrace four, five and six quarter inches in thickness by three to six inches in width, excluding 1½x6. For example: 1x3, 4, 5 and 6; 1¼x3, 4, 5 and 6; 1½x3, 4 and 5.

Boards

Boards shall embrace all thicknesses under one and a half inches by over 6 inches wide. For example: ¾, 1, 1¼ and 1⅜ inches thick by over six inches wide.

Plank

Plank shall embrace all sizes from one and one-half to under six inches in thickness by six inches and over in width. For example: 1½, 2, 2½, 3, 3½, 4, 4½, 5, 5¼, 5¾ by 6 and over in width.

Scantling

Scantling shall embrace all sizes exceeding 1½ and under 6 inches in thickness, and from 2 to under 6 inches in width. For example: 2x2, 2x3, 2x4, 2x5, 3x3, 3x4, 3x5, 4x4, 4x5 and 5x5.

Dimension

Dimension sizes shall embrace all sizes 6 inches and up in thickness by 6 inches and up in width. For example: 6x6, 6x7, 7x7, 7x8, 8x9 and up.

Stepping

Stepping shall embrace one to two and a half inches in thickness by seven inches and up in width. For example: 1, 1¼, 1½, 2 and 2½x7 and up, in width.

Rough Edge or Flitch.

Rough Edge or Flitch shall embrace all sizes one inch and up in thickness by eight inches and up in width, sawed on two sides only. For example: 1, 1½, 2, 3, 4 and up thick by eight inches and up wide, sawed on two sides only.

INSPECTION

Standard

All lumber shall be sound, sap no objection. Wane may be allowed one-eighth of the width of the piece measured across face of wane, extending one-fourth of the length

on one corner or its equivalent on two or more corners, provided that not over 10 per cent. of the pieces of any one size shall show such wane.

Merchantable.

All sizes under 9 inches shall show some heart entire length on one side; sizes 9 inches and over shall show some heart the entire length on two opposite sides. Wane may be allowed one-eighth of the width of the piece measured across face of wane, and extending one-fourth of the length of the piece on one corner or its equivalent on two or more corners; provided, that not over 10 per cent. of the pieces of any one size shall show such wane.

Prime

Flooring shall show one heart face, regardless of sap on opposite side, free from through or round shakes or knots exceeding one inch in diameter, or more than four in a board on the face side.

Boards seven inches and under wide shall show one heart face and two-thirds heart on opposite side; over seven inches wide shall show two-thirds heart on both sides, all free from round or through shakes, large or unsound knots.

Plank seven inches and under wide shall show one heart face, over seven inches wide shall show two-thirds heart on both sides, all free from round or through shakes, large or unsound knots.

Scantling shall show three corners heart, free from through or round shakes or unsound knots.

Dimension Sizes.—All square lumber shall show two-thirds heart on two sides, and not less than one-half heart on two other sides. Other sizes shall show two-thirds heart on faces and show heart two-thirds of length on edges, excepting when the width exceeds the thickness by three inches or over, then it shall show heart on the edge for one-half the length.

Stepping shall show three corners heart, free from shakes and all knots exceeding half inch in diameter, and not more than six in a board.

Rough Edge or Flitch shall be sawed from good heart timber, and shall be measured in the middle, on the narrow face, free from injurious shakes or unsound knots.

All stock to be well and truly manufactured, full to size and saw butted.

Wane on not over 5 per cent. of the pieces in any one size shall be allowed as on merchantable quality.

Where terms one-half and two-thirds heart are used they shall be construed as referring to the area of the face on which measured.

In the dressing of lumber, when not otherwise specified, one-eighth inch shall be construed as taken off by each planer cut.

1910 Rules for Inspection of

SHORT LEAF PINE, PLANK, AND DIMENSION SIZES

PROPOSED BY

New York Lumber Trade Association
Yellow Pine Exchange of New York
Savannah Board of Trade
Lumber Exchange of Baltimore
Brunswick Board of Trade
Eastern States Retail Lumber Dealers' Association
Lumbermen's Exchange of Philadelphia
Charleston, South Carolina, Dealers

AT A CONFERENCE HELD IN WASHINGTON, MAY 25th, 1910.

Effective after December 13, 1910.

1. Plank shall embrace all sizes from 1½ inch to under 6 inch in thickness by 6 inch and over in width, for example: 1½ inch, 2 inch, 2¼ inch, 2½ inch, 3 inch, 3¼ inch, 3½ inch, 4 inch, 4¼ inch, 4½ inch, 5 inch, 5¼ inch, 5½ inch, 5¾ inch, by 6 inch and over in width.

Dimensions.

2. Dimension sizes shall embrace all sizes 6 inch and up in thickness, by 6 inch and up in width, for example: 6x6 inches, 6x7 inches, 7x7 inches, 7x8 inches, 8x9 inches, and up.

3. All lumber must be well manufactured, full to sizes and sawbutted, and shall be free from the following defects: Wane, rot, unsound, loose and hollow knots, worm holes and knot holes, through shakes or round shakes that show on the surface, except as hereinafter provided for.

4. A through shake is hereby defined to be through or connected from side to side, or edge to edge, or side to edge.

5. Wane may be allowed ⅛ of the width of the piece measured across face of wane, and extending ¼ of the length of the piece on one corner or its equivalent on two or more corners, provided that not more than ten per cent. of the pieces in one size shall show such wane.

6. Knots otherwise sound but containing twig holes not more than ⅜ inch in diameter not to be considered defects. Knots having

decayed surface not over 1 inch in diameter and 3/8 inch deep not to be considered defects.

7. Large or branch knots no defect if sound, unless bunched or so frequent as to materially impair the strength of the piece.

8. A limited amount of pin worm holes well scattered in sound sap not to be considered a defect. Blue or stained sap, if sound, no defect.

9. In the measurement of dressed lumber, the width and thickness of the lumber before dressing must be taken.

CYPRESS INSPECTION RULES.

Lumber.

All lumber shall be 10, 12, 14, 16, 18, and 20 feet in length (except Tank Stock), 1, 1¼, 1½, 2, 2½, 3, 3½, and 4 inches thick, and be classed as Tank Stock, First and Second Clear, Select, Shop, and Merchantable.

Tank Stock shall be 5 inches and over in width, 1¼ to 3 inches thick, and 8 feet and over long. It may have sap 1 inch wide on one side to extend not over half the length and half the thickness of the piece, and sound knots that do not impair its usefulness for tank purposes.

First and Second Clear shall be 8 inches and over in width, and clear up to 9 inches. Pieces 10 to 12 inches wide may have two sound standard knots of 1¼ inches in diameter and 3 inches of sound bright sap, and for every 3 inches in width over 12 inches an additional standard knot and an additional inch of sound bright sap. Pieces wider than 10 inches may be half sound bright sap if free from other defects.

Selects shall be 7 inches and over in width, will admit two standard knots of 1¼ inches in diameter in pieces 10 inches or under in width, and an additional standard knot for every 2 inches in width above 10 inches. Sound sap not to be considered defect.

Above grades must be free of shake and peck.

Shop to be 7 inches or over in width, and includes all lumber that will not go into above grades, but that will cut for shop use so as to work three-fourths without waste.

Merchantable Common may be any width, admitting sap, knots, and shakes, or peck when the strength is not impaired.

Dressed Lumber.

All stock, after being worked, shall be divided into five classes: "Clear Heart," "A," "B," "C," and "D," and the several grades shall be defined as follows:

"Which shall be in lengths 10 to 20 feet."

"Clear Heart" must be clear of all sap or knots, and without blemish.

"A" must have heart face, but may have 1 inch of sap on thin edge, and may contain one small knot, and may have bright sap one-fourth its width for 6 inches from one end, or a check in one end, and not exceeding 6 inches in length.

"B" may have one-third of the face bright sap, if otherwise clear, or, in lieu of one-third sap, can contain two small sound knots, and may have checks at one end not over 9 inches long.

"C" may be all bright sap, or may have one to five knots, the whole not aggregating over 3 inches, or knots or other defects that can be removed in two cuts, with waste not exceeding 12 inches in length, or three pin-worm holes, and may have check or split at one end not exceeding 12 inches in length.

"D" may have stain sap, also pin-worm holes, unsound knots, shake, split, or other defects that will not impair its usefulness to exceed one-third.

Shingles.

"Bests."—A dimension shingle; each width separately bunched; 16 inches long; five butts to measure 2 inches; all heart; free of shakes, knots, and other defects.

"Primes."—A dimension shingle; each width separately bunched; 16 long; five butts to measure 2 inches; admitting tight knots and sap; free of shakes and other defects.

"Extra xAx."—A random width shingle, 3 inches and over in width, and may admit shingle 14 inches long. Free from unsound knots and shakes 10 inches from butt.

"Clippers."—A random width shingle, not good enough to be included in above grades.

All sales are made in accordance with above rules.

SPRUCE MANUFACTURERS' ASSOCIATION'S RULES FOR GRADING.

[Adopted by the New York Lumber Trade Association April 13, 1910.]

FIRSTS AND SECONDS.

Thickness, 1, 1¼, 1½, 2 and 3 inches.
Widths, 4, 6, 8, 10 and 12 inches.
Lengths, 10 foot and up.

Shall contain all the best of the log and shall be practically clear one face and both edges. Two or three pencil knots proportion-

al to width of piece, or wane, equal in width to half thickness and not over one-fourth of the length of the piece admitted on face side of 15 per cent. of pieces. Bright sap is no defect. Small knots admitted on reverse side. Season checks or splits equal in length to half width of piece admitted.

SELECTS.

Thickness, 1, 1¼, 1½, 2 and 3 inches.
Widths, 4, 6, 8, 10 and 12 inches.
Lengths, 10 foot and up.

May contain any number of small tight knots varying in size from lead pencil to silver quarter, according to width of piece, quality rather than quantity of knots govern, but edges must be free of knots. Bright sap no defect and very slight sap stain admissible. Wane or bark on one side equal in amount to half the thickness and one-third of the length of the piece admitted on not over 15 per cent. of pieces. Season checks or splits equal in length to two-thirds the width of the piece admitted.

DRESSING.

Thickness, 1, 1¼, 1½, 2 and 3 inches.
Widths, 4, 6, 8, 10 and 12 inches.
Lengths, 10 foot and up.

Small tight knots and large sound knots admitted without limit as to number, but character must be such that they must not pull or tear out in planing. Large mule ear or horn knots not admitted. Slight sap stain, but no black sap admitted. Wane or bark on one side equal in amount to half the thickness and one-half the length of the piece admitted on not over 15 per cent. of pieces. Season checks or splits equal in length to width of the piece admitted. Must have good smooth edges and in general be of such character that it will show smooth when planed.

MERCHANTABLE.

Boards.

Thickness, 1, 1¼, and 1½ inches.
Widths, 4, 6, 8, 10 and 12 inches.
Lengths, 8 foot and up.

Knots of every size admitted but no rotten knots or knot holes. Slight heart check or shake admitted on one side only. Small amount of black or discolored sap admitted. Wane or bark on one side equal to half the thickness and one-half the length of the piece admitted. Season checks or splits equal in length to width of piece admitted. No rot or other defect which will impair the general soundness of the piece is allowed.

Dimensions.

Thickness, 2 inches and over.
Any width and any length.

Will admit of no defect which materially impairs its strength. Straight check and heart shake admitted, but no rotten knots or rotten wood.

BOX.

Thickness, 1, 1¼, 1½, and 2 inches.
Widths, 4 inches and up.
Lengths, 6 foot and up. Not over 5 per cent. 6 foot.

Large black knots, knots not sound in character, knot holes, heart checks or shakes, black sap and small amount of hard red wood admitted. Wane or bark equal to half the thickness and one-quarter of the length on the face or equal to 20 per cent. of the piece, on the back, admitted. Season checks or splits equal to one-third the length of the piece admitted. Pin worms and scattering grub holes admitted. This grade is designed for boxes and crating and some waste or bad material is allowed.

MILL CULLS.

Thickness, 1, 1¼, 1½, and 2 inches.
Widths, 4 inches and up.
Lengths, 6 foot and up.

This grade will carry red rot, dote, heart checks, shakes and all other defects to which spruce is heir. Soft rot and other defects which render the board worthless in character are not admitted. General character of grade designed for cheap crating, boxing or sheathing.

SIZES OF DRESSED STOCK.

1-inch D1S or D2S 3/16-inch scant in thickness.

1¼-inch and 1½-inch Select and Clear D1S or D2S ⅛-inch scant in thickness.

2-inch and 3-inch D1S or D2S ¼-inch scant in thickness.

1, 1¼, 1½, 2, and 3-inch by 3-inch to 8-inch wide, D1E or D2E ⅜-inch scant in width.

1, 1¼, and 1½-inch by 9-inch to 12-inch width, D1E or D2E ½-inch scant in width.

Matched or T & G stock ¾-inch scant face width.

SOUTHERN PINE ASSOCIATION

WEIGHTS OF YELLOW PINE

WHEN WORKED TO STANDARD SIZE

LONG LEAF PINE DISTRICT.

DRY

Flooring, 13/16 x2¼	2000
Flooring, 13/16 x3¼	2200
Flooring, 13/16 x5¼	2400
Ceiling, 3/8	1000
Ceiling, ½	1200
Ceiling, 5/8	1500
Ceiling, ¾	1800
Partition, ¾	1900
Siding, from inch stock	1100
Siding, from 1¼ in. stock	1400
Drop Siding to ¾	1900
Moulded Casing. 4½ to 5¼	2000
Moulded Base, from 8, 10, 12 in. stock	2100
Finish, inch, S 1 S or S 2 S to 13/16	2600
Finish, 1¼, 1½ and 2 in., S 1 S or S 2 S to Standard Thickness	2800
Finish, 1, 1¼, 1½ and 2 in., rough	3400

For Hollow Back Flooring, Ceiling, and Drop Siding, deduct 100 lbs.

SHIPP'NG DRY

Shiplap and D & M 13/16	2500
Grooved Roofing 13/16	2600
Com. Boards and Fencing. 1x4, 6, 8 or 10 in., S 1 S or S 2 S 13/16	2700
Com. Boards, 1x12 S 1 S or S 2 S to 13/16	2800
Com. Boards and Fencing, 1x4, 6, 8 or 10 in., rough	3400
Com. Boards, 1x12, rough	3500
2x4, 2x6 and 2x8, S 1 S 1 E to 1⅜	2700
2x4, 2x6 and 2x8, rough	3400
2x10 and 2x12, S 1 S 1 E to 1⅜	2800
2x10 and 2x12, rough	3500

GREEN

2x14 and 3x12, S 1 S 1 E	3800
2x14 and 3x12, rough	4500
3x4 and 6x6, S 1 S 1 E	3800
3x4 and 6x6, rough	4500
8x8 and over, rough	4500
8x8 and over, S 4 S	3800

Plastering, Lath, dry	550
Byrkit Lath, dry	1800

SHORT LEAF PINE DISTRICT

DRY

Flooring, 13/16 x2¼	1800
Flooring, 13/16 x3¼	2000
Flooring, 13/16 x5¼	2200
Ceiling, 3/8	900
Ceiling, ½	1100
Ceiling, 5/8	1400
Ceiling, ¾	1700
Partition, ¾	1800
Siding, from inch stock	1000
Siding, from 1¼ in. stock	1250
Drop Siding, ¾ and Moulded Casing	1800
Moulded Base	2000
Finish, inch, S 1 S or S 2 S	2500
Finish, 1¼, 1½ and 2 inch, S 1 S or S 2 S	2700
Finish, 1, 1¼, 1½ and 2 in. rough	3200

For Hollow Back Flooring, Ceiling and Drop Siding, deduct 100 lbs.

SHIPPING DRY

Shiplap and D & M	2300
Grooved Roofing	2400
Com. Boards and Fencing 1x4, 6, 8, 10 in., S 1 S or 2 S to 13/16	2500
Com. Boards, 1x12, S 1 S or 2 S to 13/16	2600
Com. Boards and Fencing, 1x4, 6, 8, 10 in., rough	3300
Com. Boards, 1x12, rough	3400
2x4, 2x6 and 2x8. S 1 S 1 E to 1⅜	2500
2x4, 2x6 and 2x8 rough.	3300
2x10 and 2x12, S 1 S 1 E to 1⅜	2600
2x10 and 2x12, rough	3300

GREEN

2x14 and 3x12, S 1 S 1 E	3500
2x14 and 3x12, rough	4200
3x4 and 6x6, S 1 S 1 E	3500
4x4 and 6x8, rough	4200
8x8 and over, rough	4200

Plastering Lath, dry	500
Byrkit Lath. dry	1650

GRADING RULES

FOR

YELLOW PINE LUMBER

Copyright 1915 by
Southern Pine Association, New Orleans, La.

GENERAL INSTRUCTIONS

Yellow Pine Lumber shall be graded and classified according to the following rules and specifications as to quality, and dressed stock shall conform to the subjoined table of standard sizes—except where otherwise expressly stipulated between buyer and seller.

2. Recognized defects in Yellow Pine are knots, knot holes, splits (either from seasoning, ring hearts or rough handling), shake, wane, red heart, pith, rot, rotten streaks, worm holes, pitch streaks, pitch pockets, torn grain, loosened grain, seasoning checks, sap stains and defect in manufacturing.

KNOTS

3. Knots shall be classified as pin, standard and large, as to size; and round and spike as to form; and as sound, loose, encased, pith and rotten as to quality.

4. A pin knot is sound and not over ½-inch in diameter.

5. A standard knot is sound and not over 1½ inches in diameter.

6. A large knot is one any size over 1½ inches in diameter.

7. A round knot is oval or circular in form.

8. A spike knot is one sawn in a lengthwise direction.

The mean or average diameter of knots shall be considered in applying and construing the rules except dimension.

9. A sound knot is one solid across its face, is as hard as the wood it is in, may be either red or black, and is so fixed by growth or position that it will retain its place in the piece.

10. A loose knot is one not held firmly in place by growth or position.

11. A pith knot is a sound knot with a pith hole not more than ¼-inch in diameter in the center.

12. An encased knot is one surrounded wholly or in part by pitch or bark which may show on one or both sides of the piece. If grown fast to the board at any point on one or both sides of the piece or is so fixed by growth or position that it will retain its place in the piece it shall be con-

sidered a sound knot. (See Sections 9 and 16.)

13. A rotten knot is one not as hard as the wood it is in.

PITCH

14. Pitch pockets are openings between the grain of the wood containing more or less pitch or bark, and shall be classified as small, standard and large pitch pockets.

15. A small pitch pocket is one not over ⅛ of an inch wide.

A standard pitch pocket is one not over ⅜ of an inch wide, or 3 inches in length.

A large pitch pocket is one over ⅜ of an inch wide or over 3 inches in length.

16. A pitch pocket showing open on both sides of the piece, ⅛ of an inch or more in width, shall be considered the same as a knot-hole of equal size.

17. A pitch streak is a well-defined accumulation of pitch at one point in the piece, and when not sufficient to develop a well-defined streak, or where fiber between grains is not saturated with pitch, it shall not be considered a defect.

18. A small pitch streak shall be equivalent to not over one-twelfth the width and one-sixth the length of the piece it is in.

A standard pitch streak shall be equivalent to not over one-sixth the width and one-third of the length of the piece it is in.

WANE

19. Wane is bark, or the lack of bark or a decrease of wood from any cause on the edge of the piece.

SAP

20. Bright sap shall not be considered a defect in any of the grades provided for and described in these rules. The restriction or exclusion of bright sap constitutes a special class of material which can only be secured by special contract.

21. Sap stain shall not be considered a defect in any of the grades of Common Lumber.

MISCELLANEOUS.

22. Firm red heart shall not be considered a defect in any of the grades of Common Lumber.

23. Defects in rough stock caused by improper manufacture and drying will reduce grades, unless they can be removed in dressing such stock to standard sizes.

24. All stock except Dimension, shall be inspected on the face side to determine the grade. Stock surfaced one side, the dressed surface shall be considered the face side. Stock rough or dressed two sides, or common boards center matched or ship-lapped and S. 2 S., the best face shall be considered the face side, but the reverse side of all such stock should not be more than one grade lower.

25. Imperfect manufacture in dressed stock, such as torn grain, loosened grain, slight skips in dressing, wane, broken knots, mismatched, insufficient tongue or groove on Flooring, Ceiling, Drop Siding, etc., shall be considered defects, and will reduce grade according as they are slight or serious in their effects on the use of the stock.

26. Pieces of Flooring, Drop Siding or Partition with 3/16-inch or more of tongue; and pieces of Ceiling with ⅛-inch or more of tongue; and pieces of Shiplap with 5/16-inch of lap will be admitted in any grade. Pieces of Flooring, Drop Siding, Ceiling or Partition, having not less than 1/16-inch tongue will be admitted in No. 2 Common. Pieces of Shiplap having less than 5/16-inch and not less than ⅛-inch lap shall be admitted in No. 2 Common, 1/16-inch lap admitted in No. 3 Common Shiplap.

27. In all grades of D and Better, Flooring, and No. 1 Common and Better, Ceiling, Drop Siding, etc., wane on the reverse side, equivalent to one-third the width and one-sixth the length of any piece, provided the wane does not extend into the tongue, nor over one-half the thickness below the groove, is admissible.

28. Chipped grain consists in a part of the surface being chipped or broken out in small particles below the line of the cut, and as usually found should not be classed as torn grain and shall not be considered a defect.

29. Torn grain consists in a part of the wood being torn out in dressing. It occurs around knots and curly places, and is of four distinct characters—slight, medium, heavy and deep.

Slight torn grain should not exceed 1/32 of an inch in depth, medium 1/16 of an inch, and heavy ⅛ of an inch. Any torn grain heavier than ⅛ of an inch shall be termed deep.

30. Loosened grain consists in a point of one grain being torn loose from the next grain. It occurs on the heart side of the piece, and is a serious defect, especially in Flooring.

31. The grade of all regular stock shall be determined by the number, character, position and location of the defects visible in any piece. The enumerated defects herein described admissible in any grade are intended to be descriptive of the coarsest pieces such grades may contain.

32. Lumber and timber sawed for specific

purposes must be inspected with a view to its adaptability for the use intended. Material not conforming to standard sizes, for Agricultural Implement Companies, Wagon Companies, Car Manufacturing Companies, Railway Companies, etc., shall be governed by special contract and inspection.

33. The standard lengths are multiples of two feet, four to twenty-four feet inclusive, for Boards, Fencing, Dimension, Joists and Timbers; multiples of one foot, four to twenty feet, inclusive, for Finishing, Flooring, Ceiling, Siding, Partition, Casing, Base, Window and Door Jambs—except as hereinafter specified. Longer or shorter lengths than those herein specified are special. Special fractional lengths, when ordered, will be counted as the next higher standard length.

34. The standard of widths for lumber, S. 1 S. or S. 2 S. or rough, excluding Dimension, shall be multiples of 1 inch—3 inches and up in width.

35. On stock width shipments of No. 1 Common and Better lumber, either rough or dressed one or two sides, no piece should be counted as standard width that is more than ¼-inch scant on 8-inch and under; ⅜-inch scant on 9 and 10-inch, or ½-inch scant on 11 and 12-inch or wider. Such pieces should be measured as the next lower standard width and not reduced in grade. (For widths of No. 2 Boards and Fencing see Secs. 70 and 71.) (For Dimension see Secs. 84 and 91.)

36. Yellow Pine shall be classified as to grain as Edge Grain and Flat Grain. Edge Grain has been variously designated as rift sawn, vertical grain, quarter sawn, all being commercially synonymous terms. Edge grain stock is especially desirable for Flooring and admits no piece in which the angle of the grain exceeds 45 degrees from vertical at any point.

37. All dressed stock shall be measured and sold strip count, viz.: full size of rough material necessarily used in its manufacture.

All sizes 1 inch or less in thickness shall be counted as 1 inch thick.

38. In standard manufacture of Factory Flooring, Decking or thick dressed and matched stock, and stock grooved for splines, and for thick Shiplap, the finished width shall be ½-inch less over all than the count or measured width of the rough material used in manufacture, and the tongue and lap shall be measured to determine the finished width, and face measure shall no longer be standard.

39. Equivalent means equal, and in construing and applying these rules, the defects allowed, whether specified or not, are understood to be equivalent in damaging effect to those mentioned applying to stock under consideration.

No arbitrary rules for the inspection of lumber can be maintained with satisfaction. The variations from any given rule are numerous and suggested by practical common sense, so nothing more definite than the general features of different grades should be attempted by rules of inspection. The following, therefore, are submitted as the general characteristics of the different grades.

Lumber must be accepted on grade in the form in which it was shipped. Any subsequent change in manufacture or mill work will prohibit an inspection for the adjustment of claims, except with the consent of all parties interested.

40. The foregoing general observations shall apply to and govern the application of the following rules:

DRESSED YELLOW PINE FINISHING.

Sizes. Finishing shall be dressed to the following: 1-inch S. 1 S. or 2 S. to 13/16; 1¼-inch S. 1 S. or 2 S. to 1 1/16; 1½-inch S. 1 S. or 2 S. to 1 5/16; 2-inch S. 1 S. or 2 S. to 1¾-inches. These thicknesses also apply when S. 4 S. 1x4—S. 4 S. shall be 3½ inches wide finished; 1x5—S. 4 S. shall be 4½ inches wide; 1x6—5½ inches; 1x7—6½ inches; 1x8—7½ inches; 1x9—8½ inches; 1x10—9½ inches; 1x11—10½ inches; 1x12—11¼ inches. The foregoing widths shall also apply to stock thicker than 1 inch.

Widths. On stock width shipments of all finishing lumber, either rough or dressed one or two sides, no piece should be counted as standard width that is more than ¼-inch scant on 8-inch and under; ⅜-inch scant on 9 or 10-inch, or ½-inch scant on 11 or 12-inch or wider. Such pieces should be measured as the next lower standard width and not reduced in grade.

Lengths. Standard Lengths are 4 to 20 feet and in shipments of mixed lengths, 5% of 8 or 9 foot in grade of C and Better shall be admitted.

The above per cent is allowed in all shipments of mixed lengths even though the number of feet of each length in the order for such shipment be specifically stated, 4, 5, 6 and 7 ft. not to be included except by special agreement.

Grades. A, B and C.

41. **A Finishing.** Inch, 1¼, 1½ and 2-inch dressed one or two sides up to and including 8 inches wide, must show one face practically clear of all defects, 9 or 10 inches wide, in addition to the equivalent of one split in end not more than 6 inches long, will admit any one of the following defects; one small pitch pocket; one pin knot; pitch streak or sap stain not to ex-

ceed the equivalent of 6 square inches. One-third of any shipment of 11 and 12-inch, in addition to the equivalent of one split in end which should not exceed in length the width of the piece, will admit any one of the following defects or its equivalent: three pin knots; one standard knot; three small pitch pockets; one standard pitch pocket; one small pitch streak; small seasoning checks; sap stain equivalent to 8 square inches is allowed. (See Sec. 31.)

13-inch and wider will admit two of the above defects or their equivalent. Pieces otherwise admissible, which have loosened or torn grain on the face side, shall be put in a lower grade.

42. **B Finishing.** Inch, 1¼, 1½ and 2-inch dressed one or two sides up to and including 10 inches in width, in addition to the equivalent of one split in end which should not exceed in length the width of the piece, will admit any two of the following or their equivalent of combined defects: slight torn grain; three pin knots; one standard knot; three small pitch pockets; one standard pitch pocket; one standard pitch streak; 5% of sap-stain; wane not to exceed 1 inch in width, ¼-inch in depth and one-sixth the length of the piece; small seasoning checks.

11-inch and wider will admit three of the above defects or their equivalent; but sap stain shall not exceed 10%.

43. **C Finishing.** Up to and including 10-inch in width will admit in addition to the equivalent of one split in end which should not exceed in length the width of the piece, any two of the following or their equivalent of combined defects: 25% of sap stain; 25% firm red heart; two standard pitch streaks; medium torn grain in three places in one piece; slight shake; seasoning checks that do not show an opening through; two standard pitch pockets; six small pitch pockets; two standard knots; six pin knots; wane one inch in width, one-half inch in depth and one-third the length of the piece. Defective dressing or slight skips in dressing will also be allowed that does not prevent its use as finish without waste. 11 and 12-inch will admit one additional defect or its equivalent. Pieces wider than 12 inches will admit two additional defects to those admitted in 10-inch or their equivalent, except sap stain, which shall not be increased.

Pieces otherwise as good as B, will admit of 20 pin worm holes.

43½. **Special.** In case both sides are desired A, B or C grade, or free from all defects, special contract must be made. Defective dressing or slight skips in dressing on the reverse side of Finshing are admissible. (See Sections 24, 25 and 39.)

44. **Panel Shop.** Panel shop is 10 inches and 12 inches wide, all lengths from 8 to 20 feet or longer. Must be practically free from pitch streaks. May contain any kind of defects that can be removed by cross-cutting the board. Such defects must be limited in number and location so that cross-cutting to remove them will not use more than one-quarter of the length of the piece and the residue of the piece shall be suitable for Nos. 1 and 2 panel, and all lengths 18 inches and longer, but such residue shall not be considered to be of any special stock length, but will represent the balance of the board after the defects as above named have been removed.

No. 1 Panels must be practically free from defects on both sides and well manufactured.

No. 2 Panels up to 24 inches long will admit any one of the following defects which may show on both sides: one small sound knot not to exceed ¼-inch in diameter, one small pitch streak, one small pitch pocket the equivalent of ⅛-inch wide and 1/16-inch deep, slight sap stain, slight defect in manufacture. Panels over 24 inches long will admit two of the above knots, or pitch pockets if not grouped.

FLOORING.

Sizes. D and Better, 1x3, 1x4 and 1x6 inches shall be worked to 13/16x2¼, 3¼ and 5¼ inches; 1¼-inch Flooring shall be worked to 1 3/32 inches thick; 1½-inch Flooring to 1 11/32 inches thick, the same width and the same matching as 1-inch stock. (See cut on page 32.)

Lengths. Standard lengths 4 to 20 foot, with not to exceed 5% of 8-foot or 9-foot lengths in mixed length shipments of B and Better, and in addition 5% of 6-foot or 7-foot in C, D and No. 1 Common, and in addition 5% of 4-foot or 5-foot in No. 2 Common.

The above per cent is allowed in all shipments of mixed lengths even though the number of feet of each length in the order for such shipments be specifically stated.

Grades. A, B, C, D, No. 1 Common, No. 2 Common and No. 3 Sheathing (or No. 3 Common Flooring) Flat Grain; and A, B, C, D and No. 1 Common Edge Grain.

Special Section. Defects named in Flooring are based upon a piece manufactured from 1x4—12 feet and pieces larger or smaller than this will take a greater or less number of defects, proportioned to their size on this basis. Except that standard knots shall not exceed 1¼-inch in diameter in 3-inch flooring.

45. **A Flat Flooring** must be practically

free from defects on the face side and well manufactured.

46. **B Flat Flooring** will admit any two of the following or their equivalent of combined defects: 15% sap stain; 15% firm red heart; three pin knots; one standard knot; three small pitch pockets; one standard pitch pocket; one standard pitch streak; slight torn grain; small seasoning checks; six pin worm holes.

47. **C Flat Flooring** will admit any two of the following defects or their equivalent of combined defects: 25% of sap stain; 25% of firm red heart; two standard pitch streaks; medium torn grain, or other machine defects that will lay without waste; slight shake that does not go through or seasoning checks that do not show an opening through; two standard pitch pockets; six small pitch pockets; two standard knots or six pin knots; 12 pin worm holes.

48. **Edge Grain Flooring** shall take the same inspection as Flat Grain except as to the angle of the grain. (See Sec. 36.)

49. Heart Face Edge Grain shall be free from sap on face side.

50. **D Flat Flooring** will admit the following defects or their equivalent of combined defects; sound knots not over one-half the cross section of the piece in the rough at any one point throughout its length; three pitch knots; pitch; pitch pockets; sap stain; firm red heart; seasoning checks that do not show an opening through; shake that does not go through; a limited number of pin worm holes well scattered; loosened or heavy torn grain, or other machine defects that will lay without waste.

Pieces otherwise as good as B may have one defect (like a knot hole) that can be cut out by wasting 1½ inches of the length of the piece, provided both pieces are 16 inches or over in length after cutting out such defects.

50½. **No. 1 Common Flooring** is the combined grade of C and D flooring, and will admit all pieces that will not grade B and are better than No. 2 Common.

51. **No. 2 Common Flooring** admits all pieces that will not grade as good as D flooring, that can be used for cheap floors without a waste of more than one-fourth the length of any one piece. (See Sec. 26.)

52. **No. 3 Sheathing (or No. 3 Common Flooring)**, will admit all pieces that cannot be used as No. 2 Common Flooring, but are still available as cheap sheathing or lathing without a waste of more than one-fourth the length of any one piece.

53. **Center Matched Flooring (or S. 2 S. and C. M.)**, shall be required to come up to grade on face side only, and the defects admissible on the reverse side of standard matched shall be allowed.

53½. **No. 1 Common Factory Flooring** will admit of sound knots, not over one-half the cross-section of the piece at any point throughout the length; pitch pockets; sap stain; shakes that do not go through; firm red heart; seasoning checks which do not show an opening through the piece; wane one-fourth inch deep on the face; a limited number of pin worm holes well scattered; loosened or heavy torn grain or other machine defects which will lay without waste; and pitch knots which will not cause a leakage of grain. (See Secs. 38 and 117.)

CEILING.

Sizes. Ceiling shall be worked to the following: ⅜-inch Ceiling, 5/16-inch; ½-inch Ceiling, 7/16-inch; ⅝-inch Ceiling, 9/16-inch; ¾-inch Ceiling, 11/16-inch. Same width as Flooring. The bead on all Ceiling and Partition shall be depressed 1/32 of an inch below surface line of piece. (For drawings scaled to actual size see pages following these rules.)

Lengths. Standard lengths are 4 to 20 feet. 5% of 8 or 9 feet is allowed in mixed length shipments of B and Better Ceiling and in addition 5% of 6 or 7 feet in No. 1 Common; and in addition 5% of 4 or 5 feet in No. 2 Common.

The above per cent is allowed in all shipments of mixed lengths, even though the number of feet of each length in the order for such shipment be specifically stated.

Grades: A, B, No. 1 and No. 2 Common.

Special Section. Defects named in Ceiling are based upon a piece manufactured from 1x4—12 feet and pieces larger or smaller than this will take a greater or less number of defects, proportioned to their size on this basis.

54. **A Ceiling** must be practically free from defects on the face side, and well manufactured.

55. **B Ceiling** will admit of any two of the following defects or their equivalent of combined defects: Slight torn grain; three pin knots; one standard knot; three small pitch pockets; one standard pitch pocket; one small pitch streak; small seasoning checks; 15% sap stain; 15% firm red heart; six pin worm holes.

56. **No. 1 Common Ceiling** will admit the following defects or their equivalent of combined defects: Sound knots not over one-half the cross-section of piece in the rough; sap stain; pitch streaks; pitch pockets; firm red heart; slight shake; heavy torn grain; seasoning checks that do not

show an opening through; defects in manufacture that will lay without waste; a limited number of pin worm holes well scattered.

Pieces otherwise as good as B may have one defect (like a knot hole) that can be cut out by wasting 1½ inches of the length of the piece, provided both pieces are 16 inches or over in length after cutting out such defects.

57. **No. 2 Common Ceiling** admits of all pieces not as good as No. 1 Common that can be used without waste of more than one-fourth the length of any one piece. (See Sec. 26.)

WAGON BOTTOMS.

Sizes. Unless otherwise ordered (See Sec. 32), shall be made in sets of 38 and 42 inches face, and from stock 4 inches or over in width. Standard thickness shall be 13/16-inch.

Grades: A and B.

58. **Wagon Bottoms,** unless otherwise ordered (see Sec. 32), shall be graded the same as A and B Flat Flooring.

DROP SIDING.

Sizes. D and M shall be worked to ¾x3¼ and 5¼ inches face, 3½ and 5½ inches over all. Worked Shiplap to ¾x3-inch face, 3½ inches over all, ¾x5-inch face, 5½ inches over all. Patterns that are not shown in Yellow Pine Manufacturers' Association Moulding Book of January, 1908, Edition, are considered special.

Lengths. Standard lengths 4 to 20 feet, 5% of 8 or 9 feet is allowed in mixed length shipments of B and Better Drop Siding, and in addition 5% of 6 or 7 feet in No. 1 Common, and in addition 5% of 4 or 5 feet in No. 2 Common.

The above per cent is allowed in all shipments of mixed lengths, even though the number of feet of each length in the order for such shipment be specifically stated.

Grades: A, B, No. 1 and No. 2 Common.

Special Section. Defects named in Drop Siding are based upon a piece manufactured from 1x6—12 feet, and pieces larger or smaller than this will take a greater or less number of defects, proportioned to their size on this basis.

For Grades of 8-inch Barn Siding (see Sections 69 and 71). (For **Size** see Sec. 111.)

59. **A Drop Siding** must be practically free from defects on the face side and well manufactured.

60. **B Drop Siding** will admit any two of the following defects, or their equivalent of combined defects: medium torn grain; three pin knots; one standard knot; 15% sap stain; 15% firm red heart; small seasoning checks; 6 pin worm holes, or any one of the above defects combined with one of the following: three small pitch pockets, or one small pitch streak.

61. **No. 1 Common Drop Siding** will admit one standard pitch streak or one standard pitch pocket or their equivalent; and in addition, sound knots not over one-half the width of piece in the rough; sap stain; firm red heart; slight shake; heavy torn grain; defects in manufacture that will lay without waste; seasoning checks that do not show an opening through; a limited number of pin worm holes, well scattered.

Pieces otherwise as good as B may have one defect (like a knot hole) that can be cut out by wasting 1½ inches of the length of the piece, provided both pieces are 16 inches or over in length after cutting out such defects.

62. **No. 2 Common Drop Siding** admits of all pieces not as good as No. 1 Common that can be used without waste of more than one-fourth the length of any one piece.

BEVEL SIDING.

Sizes. To be made from stock S. 4 S. worked to 13/16x3½ and 5½ and resawed on a bevel.

Lengths. Standard lengths 4 to 20 feet. 5% of 8 or 9 feet is allowed in mixed length shipments of B and Better Bevel Siding, and in addition 5% of 6 or 7 feet in No. 1 Common; and in addition 5% of 4 or 5 feet in No. 2 Common.

The above per cent is allowed in all shipments of mixed lengths, even though the number of feet of each length in the order for such shipment be specifically stated.

Grades: A, B, No. 1 and No. 2 Common.

63. **Bevel Siding** shall be graded according to the rules for Drop Siding, and will admit in addition slight imperfections on the thin edge, which will be covered by the lap when laid 2½ and 4½ inches to the weather.

PARTITION.

Sizes. Partition shall be worked to ¾x 3¼ and 5¼ inches. (For drawing scaled to actual size, see page 32.)

Lengths. Same percentage of short lengths allowed as in Ceiling.

Grades: A, B, No. 1 and No. 2 Common.

64. **Partition** shall be graded according to Ceiling rules, and must meet the requirements of the specified grades on the face side only, but the reverse side shall not be more than one grade lower and shall not cause waste in No. 1 Common and Better.

MOULDED CASING AND BASE, WINDOW AND DOOR JAMBS.

Sizes of Moulded Casing and Base. Shall be worked to ¾-inch, as per patterns shown in Yellow Pine Manufacturers' Association Moulding Book, 1908 Edition. (See Section 37.) For Widths of Plain Casing, see Finishing S. 4 S.

Window and Door Jambs. (See Section 37.) Dressed, Rabbeted and Plowed as ordered.

Grades: A, B and C.

65. **A Moulded Casing and Base** must be practically free from defects on the face side and well manufactured.

66. **B Casing or Base** shall admit the same defects as are admissible in the same widths of B Finishing, except wane. (See Sec. 42.)

66½. **C Casing or Base** shall admit the same defects as are admissible in the same widths of C Finishing, except wane. (See Sec. 43.)

67. **Window and Door Jamb** shall be graded the same as Moulded Casing and Base. (See Section 37 for width.)

67½. **B and Better Mouldings.** One-third of any item may contain any one of the following defects or its equivalent: One pin knot; small pitch pockets; pitch one inch wide; six inches long; slight sap stain covering six inches of the length of the piece; three pin worm holes; slight defects in dressing. (See Sec. 31.) Standard lengths: 8 feet and longer and in shipments of mixed lengths, 5% or 6 or 7 feet shall be admitted, even though the number of feet of each length in such shipment be specifically stated. Sizes as per Southern Pine Manufacturers' Association Moulding Book, 1915 Edition.

COMMON BOARDS, SHIPLAP AND BARN SIDING.

Sizes of Boards. 1-inch S. 1 S. or 2 S. to 13/16, 1¼-inch S. 1 S. or 2 S. to 1 1/16, 1½-inch S. 1 S. or 2 S. to 1 5/16. These thicknesses also apply when S. 4 S.

Widths. On stock width shipments of No. 1 Common, either rough or dressed one or two sides, no piece should be counted as standard width that is more than ¼-inch scant on 8-inch and under; ⅜-inch scant on 9 or 10 inch, or ½-inch scant on 11 or 12 inch or wider. Pieces narrower than this should be measured as the next lower standard width and not reduced in grade. Material when ordered worked two faces to serve two purposes like grooved roofing S. 2 S., shiplap S. 2 S., center matched S. 2 S., or one face worked to a pattern, like barn siding, shall be inspected from the best face. 1¼-inch and 1½-inch Common shall take the same inspection as 1-inch boards.

Boards 1x8 S. 4 S. shall be worked 7½ inches wide; 1x9—8½ inches; 1x10—9½ inches; 1x11—10½ inches; 1x12—11¼ inches.

Sizes of No. 1 Common D. & M. and Barn Siding. 8, 10 and 12-inch shall be worked to ¾x7⅛, 9⅛ and 11⅛ inches. (See cut, following these rules, for standard bead for barn siding.) Shiplap worked to ¾-inch thick, face same width as D. & M. and barn siding.

Standard lengths are multiples of two feet, four to 24 feet, inclusive, but lengths shorter than 10 feet shall not be included in miscellaneous or mixed length shipments except by agreement.

Grades: No. 1, No. 2, No. 3 and No. 4 Common.

68. **No. 1 Common Boards,** dressed one or two sides, will admit any number of sound knots, the mean or average diameter of any one knot shall not be more than one-fourth of the cross-section if located on the edge, and shall not be more than one-third of the cross-section if located away from the edge; two pith knots; the equivalent of one split not to exceed in length the width of the piece; torn grain; pitch; pitch pockets; slight shake; sap stain; seasoning checks; firm red heart; wane ½-inch deep on edge, not exceeding 1½ inches wide and one-third the length of the piece or its equivalent, and a limited number of pin worm holes well scattered, or defects equivalent to the above.

69. **No. 1 Common Shiplap or D. & M. and Barn Siding** shall be graded by rules governing No. 1 Common Boards, except as to wane, which shall not be so deep as to extend into the tongue or one-half the thickness of the top lip on the groove in D. & M., or over one-half the thickness of the lap in Shiplap on the face side. (See Sec. 26.)

GROOVED ROOFING.

Sizes of Grooved Roofing. 10 and 12 inch S. 1 S. and 2 E. shall be worked to 13/16x9½ and 11¼ inches.

Size of Groove. ½-inch wide, ¼-inch

deep and located 1 3/16 inches from outer edge of the groove to edge of board.

Standard lengths are multiples of 2 feet, 4 to 24 feet, inclusive, but lengths shorter than 10 feet shall not be included in miscellaneous or mixed lengths' shipments except by agreement.

70. **Grooved Roofing** shall be graded by rules governing No. 1 Common Boards, omitting the pith knots, worm holes, splits and seasoning checks that show an opening through.

No. 2 COMMON BOARDS, D. & M. or SHIPLAP, GROOVED ROOFING AND BARN SIDING.

Sizes. 1-inch S. 1 S. or 2 S. to 13/16, 1¼-inch S. 1 S. or 2 S. to 1 1/16, 1½-inch S. 1 S. or 2 S. to 1 5/16. These thicknesses also apply when S. 4 S. Shiplap D. & M. and Barn Siding worked to ¾-inch thick.

Widths. On stock width shipments of No. 2 Common, either rough or dressed one or two sides, no piece should be counted as standard width that is more than ½-inch scant on 8-inch and under; ⅝ on 9 or 10-inch and ¾-inch on 11 and 12-inch or wider. Pieces narrower than this should be measured as the next lower standard of width and not reduced in grades.

Standard lengths are multiples of two feet, four to 24 feet, inclusive, but lengths shorter than 10 feet shall not be included in miscellaneous or mixed length shipments except by agreement.

71. **No. 2 Common Boards**, dressed one or two sides, **No. 2 Common Shiplap, Grooved Roofing, D. & M. and Barn Siding**, will admit knots, not necessarily sound, and the mean or average diameter of any one knot shall not be more than one-third of the cross-section if located on the edge, and shall not be more than one-half of the cross-section if located away from the edge; if sound, may extend one-half the cross-section if located on the edge; worm holes; splits one-fourth the length of the piece; through rotten streaks one-fourth the length of the piece, or its equivalent of unsound red heart; through heart shakes, or wane two inches wide; one-half the length of the piece, or defects equivalent to the above.

A knot hole three inches in diameter will be admitted, provided piece is otherwise as good as No. 1 Common.

72. **No. 3 Common Boards. No. 3 Common Shiplap** (see Sec. 26) **D. & M. and Barn Siding** is defective lumber, and will admit of coarse knots, knot holes, very wormy pieces, red rot and other defects that will not prevent its use as a whole for cheap sheathing, or cutting three-fourths its length as No. 2 Common.

73. **No. 4 Boards** shall include all pieces that fall below the grade of No. 3 Common. It is the lowest recognized grade and it is offered on its merits as defective lumber, mill inspection to be final.

74. Miscut 1-inch Common Boards which do not fall below ¾-inch in thickness shall be admitted in No. 2 Common, provided the grade of such thin stock is otherwise as good as No. 1 Common.

FENCING. 3, 4, 5 AND 6 INCHES WIDE.

Sizes. 1-inch S. 1 S. or 2 S. to 13/16, 1¼-inch S. 1 S. or 2 S. to 1 1/16, 1½-inch S. 1 S. or 2 S. to 1 5/16. These thicknesses also apply when S. 4 S.

When 6-inch Fencing is S. 2 S. & C. M., the finished thickness shall be ¾-inch and inspected under Flooring rules.

Widths. On stock width shipments of 3, 4, 5 and 6-inch No. 1 Common, no piece shall be counted as standard width that is more than ¼-inch scant in width. Pieces narrower than this should be measured as the next lower standard width and not reduced in grade.

Standard lengths are multiples of two feet, four to 24 feet, inclusive, but lengths shorter than 10-foot shall not be included in miscellaneous or mixed length shipments except by agreement.

Grades: No. 1, No. 2, No. 3 and No. 4 Common.

75. **No. 1 Fencing** will admit the following defects or their equivalent: Sound knots, the mean or average diameter of any one knot shall not be more than one-half the cross-section of the piece at any point throughout its length; three pith knots; wane one-half inch deep on edge not exceeding 1½ inches wide and one-half the length of the piece; torn grain; pitch; pitch pockets; sap stain; seasoning checks; slight shake; firm red heart and a limited number of small worm holes, well scattered, and the equivalent of one split the width of the piece.

No. 2 FENCING.

Sizes. 1-inch S. 1 S. or 2 S. to 13/16-inch.

Widths. In 3, 4, 5 and 6 inch No. 2 Common stock, no piece shall be counted as standard width that is more than ½-inch scant in width. Such pieces should be measured as the next lower standard of width, and not reduced in grade.

76. **No. 2 Fencing**, in addition to the defects allowed in No. 1 Common, will admit

the following defects or their equivalent: Knots, not necessarily sound, the mean or average diameter of any one knot shall not be more than one-half the cross-section if located on the edge, and shall not be more than two-thirds of the cross-section if located away from the edge; one split one-fourth the length of the piece; worm holes, through rotten streak one-fourth the length of the piece, or the equivalent of unsound red heart; shake or wane, but must not cut to waste.

A knot hole 1½ inches in diameter or its equivalent in small hollow knots will be allowed, provided the piece is otherwise as good as No. 1 Common.

77. **No. 3 Fencing** is defective lumber, and will admit of coarse knots, knot holes, very wormy pieces, red rot and other defects that will not prevent its use as a whole for cheap sheathing, or cutting three-fourths its length as No. 2 Common.

78. **No. 4 Fencing** shall include all pieces that fall below the grade of No. 3 Common. It is the lowest recognized grade, and it is offered on its merits as defective lumber, mill inspection to be final.

79. Miscut 1-inch Common Fencing which does not fall below ¾-inch in thickness shall be admitted in No. 2 Common, provided the grade of such thin stock is otherwise as good as No. 1 Common.

DIMENSION AND HEAVY JOIST.

Sizes. Dimension shall be worked to the following: 2x4 S. 1 S. and 1 E. to 1⅝x3⅝ inches; 2x6 S. 1 S. and 1 E. to 1⅝x5⅝ inches; 2x8 S. 1 S. and 1 E. to 1⅝x7½ inches; 2x10 S. 1 S. and 1 E. to 1⅝x9½ inches; 2x12 S. 1 S. and 1 E. to 1⅝x11½ inches. Dimension S. 4 S. ⅛-inch less in thickness and width than S. 1 S. 1 E. shall be standard, but no objection shall be made to stock finished to the standard size for S. & E.

Heavy Joists shall be worked to the following: 2x14, 2½ and 3x10, 3x12 and 3x14, S. 1 S. and 1 E., green, ¼-inch off side and ½-inch off edge S. 4 S. ¼-inch off each face surface. Heavy Joists, rough, green, must not be over ¼-inch scant in width or thickness.

Dry 2x14 shall be dressed to the standard thickness of 2x12.

Lengths.

Standard lengths are multiples of two feet, four to 24 feet inclusive, but lengths shorter than 10-foot shall not be included in miscellaneous or mixed length shipments except by agreement.

Grades: No. 1, No. 2 and No. 3 Common.

80. **Inspection of Dimensions** is a question of strength and uniformity of size, and whatever reduces its strength in cross-section must be considered a defect to that extent. In computing the area of cross-section occupied by defects the size of the piece in the rough shall be considered.

81. **No. 1 Common Dimension and Heavy Joists** will admit sound knots, none of which in 2x4s should be larger than two inches in diameter on one or both sides of the piece, and on wider stock which do not occupy more than one-third of the cross-section at any point throughout its length, if located at the edge of the piece; or more than one-half of the cross-section if located away from the edge; pith knots, or smaller defective knots which do not weaken the piece more than the knot aforesaid; will admit of seasoning checks; firm red heart; heart shakes that do not go through; wane ¾ of an inch deep on edge, ¼ the width and one-third the length of the piece; pitch; sap stain; pitch pockets; splits in ends not exceeding in length the width of the piece; a limited number of small worm holes, well scattered, and such other defects as do not prevent its use as substantial structural material.

82. **No. 2 Common Dimension** may have knots not necessarily sound, which do not occupy more than one-half of the cross-section at any one point if located at the edge of the piece, nor more than two-thirds of the cross-section if located away from the edge; smaller, loose, hollow or rotten knots that do not weaken the piece more than the knots aforesaid, will admit rotten streaks; shake; wane; worm holes; split not to exceed one-quarter the length of the piece, and other defects which do not prevent its use without waste.

83. **No. 3 Dimension** will include all pieces falling below No. 2 Grade which are sound enough to use for cheap building material, by wasting 25% of each piece of one-third of number of pieces in any item of a shipment, but it must not be more than ½-inch scant of standard finished width or ⅜-inch scant in thickness. (See Sec. 31.)

84. Miscut 2-inch Common stock which does not fall below 1½ inches in thickness or ⅛-inch scant in width from standard size, shall be admitted in No. 2 Common, provided such pieces are in all other respects as good as No. 1 Common.

ROUGH YELLOW PINE FINISHING.

Widths. On stock width shipments of C and Better Finish, either rough or dressed one or two sides, no piece should be counted

as standard width that is more than ¼-inch scant on 8-inch and under; ⅜-inch scant on 9 and 10-inch, or ½-inch scant on 11 and 12-inch or wider. Such pieces should be measured as the next lower standard of width and not reduced in grade.

Lengths. Standard Lengths are 4 to 20 feet, and in shipments of mixed lengths 5% of 8 or 9 feet in grades of C and Better shall be admitted.

The above per cent is allowed in all shipments of mixed lengths, even though the number of feet of each length in the order for such shipment be specifically stated, 4, 5, 6 and 7 ft. not to be included except by special agreement.

85. Finish must be evenly manufactured, and shall embrace all sizes from 1 to 2 inches in thickness by 3 inches and over in width.

86. No inch, 1¼ and 1½-inch finishing lumber, unless otherwise ordered, shall measure, when dry, more than 1/16-inch scant in thickness; on 2-inch it may be ⅛-inch scant.

87. Wane, seasoning checks and other defects that will dress out in working to standard thickness and widths are admissible.

88. Subject to the foregoing provisions, Rough Finishing shall be graded according to the specifications applying to dressed finishing lumber.

89. All finishing lumber, ordered rough, if thicker than the count thickness for dry or green stock, may be dressed to such count thickness, and when so dressed shall be considered as rough. When like grade on both faces is required, special contract must be made.

COMMON BOARDS, FENCING AND DIMENSION.

90. Rough 1-inch Common Boards and Fencing should not be less than ⅞-inch thick when dry; 1¼-inch and 1½-inch, ⅛-inch scant of count thickness.

91. Rough 2-inch Common should not be less than 1⅞ inches thick when green, or 1¾ inches thick when dry. The several widths should not be less than ⅛-inch over the standard dressing width for such stock when dry.

92. Rough Common Dimension of a greater thickness than 2 inches and less than 4 inches, shall be subject to special contract as to thickness and width.

93. Rough Dimension, if thicker than count thickness for dry or green stock, may be dressed to such count thickness, and when so dressed shall be considered as rough stock.

94. The defects admissible in Rough Boards, Fencing and Dimension shall be the same as those applying to dressed stock of like kind and grade, and such further defects as would disappear in dressing to standard sizes of such material shall be allowed.

No. 1 COMMON TIMBERS.

Sizes. Common Timber shall be worked to the following: 4x4, 4x6, 6x6, ⅜-inch off side and edge. Surfaced 4 sides, ¼-inch off each side. 6x8 and larger S. 3 S. or S. 4 S., ¼-inch off each side surfaced.

Lengths. Standard lengths are multiples of two feet, four to 24 feet, inclusive, but lengths shorter than 10 feet shall not be included in miscellaneous or mixed length shipments except by agreement.

95. Rough Timbers 4x4 and larger shall not be more than ¼-inch scant at any point when green, and be well manufactured; may have 1½-inch wane on one corner, measured on face (or its equivalent on two or more corners), one-third the length of the piece; timbers 10x10 in size may have two-inch wane as above; larger sizes may have wane as above in proportion to size; timbers may contain sound knots; the diameter of any one knot shall not exceed two inches in 4x4 to 6x6; two and one-half inches in 6x8 to 8x10; three inches in 10x10 to 10x12; three and one-half inches in 12x12 to 12x14; four inches in 14x14 to 14x16; four and one-half inches in 16x16 to 16x18. In sizes not mentioned, the diameter of knots admissible will increase or decrease in proportion to the size of the timbers on same basis as above specified. The diameter of such knots to be determined by measuring across the knots at practically right angles with the grain of the knot; or the equivalent of the above in grouped knots at any one point, or in small defective knots, will be allowed.

Shakes one-sixth the length of the piece are admissible, and seasoning checks shall not be considered a defect.

96. Dressed Timbers shall conform in grading to the specifications applying to rough timbers of same size.

97. Rough Timbers, if thicker than count thickness for green stock, may be dressed to such count thickness, and when so dressed shall be considered as rough stock.

98. **Yellow Pine Plastering Lath.** No. 1 should measure 2 inches in thickness to every five lath, green, the minimum thickness of any one lath shall not be less than 5/16 of an inch, green, and should not be less than 1 7/16 inches in width, green,

length 4 feet; 1⅝ inches thickness to every 5 lath, dry, and should not measure less than 1 5/16 inches in width dry. Will admit wane ⅛ of an inch deep, ¼ of an inch on face and 6 inches long, pin worm holes and one pin knot. Must not be more than ⅓-inch short in length. Blue sap stain shall not be considered a defect.

99. **No. 2** shall consist of pieces that fall below the grade of No. 1 which are not less than 1¼ inches in width, ¼ of an inch thick, when dry, and are not more than ¾-inch short in length. Will admit wane; worm holes; knots and other defects that will not prevent their use the entire length without waste.

BYRKIT LATH.

Sizes. ¾x3½ and 5¼ inches wide; lengths 4 feet and upward.

100. **Standard Byrkit Lath** shall consist of material that will be held firmly in place and support plaster by ordinary nailing by not wasting more than 10% of any piece, and that will present a full surface with no openings over ½-inch in width and 3 inches in length. The ends of pieces of Byrkit Lath are not expected to meet on studding, and only such quantity shall be counted waste as is necessary to remove a defect.

STANDARD SIZES OF DRESSED LUMBER.

102. **Finishing** shall be dressed to the following: 1-inch S. 1 S. or 2 S. to 13/16; 1¼-inch S. 1 S. or 2 S. to 1 1/16; 1½-inch S. 1 S. or 2 S. to 1 5/16; 2-inch S. 1 S. or 2 S. to 1¾ inches. These thicknesses also apply when S. 4 S. 1x4 S. 4 S. shall be 3½ inches wide finished; 1x5 S. 4 S. shall be 4½ inches wide; 1x6—5½ inches; 1x7—6½ inches; 1x8—7½ inches; 1x9—8½ inches; 1x10—9½ inches; 1x11—10½ inches; 1x12—11¼ inches.

The foregoing widths shall also apply to stock thicker than 1 inch.

103. **Moulded Casing and Base** shall be worked to ¾-inch as per patterns shown in Yellow Pine Manufacturers' Association Moulding Book, 1908 Edition.

104. **Flooring.** The standard of 1x3, 1x4 and 1x6 inches D and Better shall be worked to 13/16x2¼, 3¼ and 5¼ inches (see cut on page 32); 1¼-inch Flooring shall be 1 3/32 inches thick; 1½-inch Flooring to 1 11/32 inches thick, the same width and matching as 1-inch stock.

105. **Drop Siding.** D. and M. shall be worked to ¾x3¼ and 5¼ inches face, 3½ and 5½ over all. Worked shiplap ¾x3 inches face, 3½ over all; ¾x5-inch face, 5½ inches over all. Patterns that are not shown in Yellow Pine Manufacturers' Association Moulding Book of January, 1908, Edition, are considered special.

106. **Ceiling** shall be worked to the following: ⅜-inch Ceiling, 5/16-inch; ½-inch Ceiling, 7/16-inch; ⅝-inch Ceiling, 9/16-inch; ¾-inch Ceiling, 11/16-inch. Same width as Flooring. The standard working of Ceiling shall be beaded center and edge with slight bevel on groove edge. The bead on all Ceiling and Partition shall be depressed 1/32 of an inch below surface line of piece.

107. **Partition** shall be worked to the following: ¾x3¼ and 5¼ inches. Same standard for location and size of bead as applies to Ceiling. (See Sec. 106.)

108. **Bevel Siding.** To be made from stock S. 4 S. worked to 13/16x3½ and 5½, and resawed on a bevel.

109. **Window and Door Jambs.** (See Sec. 37.) Dressed, Rabbeted and Plowed as ordered.

110. **Boards and Fencing.** 1-inch S. 1 S. or 2 S. to 13/16-inch, also when S. 4 S.

111. **Barn Siding.** D. & M. 8, 10 and 12 inches, shall be worked to ¾x7⅛, 9⅛ and 11⅛ inches face; 7⅜, 9⅜ and 11⅜ inches over all.

Barn Siding Shiplap, 8, 10 and 12 inches, shall be worked to ¾x7⅛, 9⅛ and 11⅛ inches face, with ⅜-inch lap, ⅜-inch thick and ⅜-inch long; 7½, 9½ and 11½ inches over all.

112. **D. & M. Common Boards,** 8, 10 and 12 inches, shall be worked to the following: ¾x7⅛, 9⅛ and 11⅛ inches; 7⅜, 9⅜ and 11⅜ inches over all.

113. **Grooved Roofing.** 10 and 12-inch S. 1 S. and 2 E. shall be worked to 13/16x9½ and 11¼.

114. **Wagon Bottoms,** unless otherwise ordered (see Sec. 32), shall be made in sets 38 and 42 inches face, and from stock 4 inches or over in width.

Standard thickness shall be 13/16-inch.

115. **Dimension** shall be worked to the following: 2x4 S. 1 S. and 1 E. to 1⅝x3⅝ inches; 2x6 S. 1 S. and 1 E. to 1⅝x5⅝ inches; 2x8 S. 1 S. and 1 E. to 1⅝x7½ inches; 2x10 S. 1 S. and 1 E. to 1⅝x9½ inches; 2x12 S. 1 S. and 1 E. to 1⅝x11½ inches. Dimensions S. 4 S. ⅛-inch less than standard size S. 1 S. and 1 E.

115½. All sizes in Dimension are subject to natural shrinkage.

116. **Heavy Joists** shall be worked to the following: 2x14, 2½ and 3x10, 12 and 14, S. 1 S. and 1 E., green, ¼-inch off side and ½-inch off edge, S. 4 S. ¼-inch off each face surfaced. Heavy Joists, rough,

green, must not be over ¼-inch scant in width or thickness.

117. **Heavy Flooring.** For 2 and 2½ inch matching the thickness should be ⅜ of an inch less than the rough material when surfaced one side; when S. 2 S., should be 7/16-inch less than count thickness, or 1/16-inch less than when S. 1 S. The tongue should be ⅜-inch thick and ⅜-inch long. For 3-inch and thicker matching the tongue should be ¾-inch thick and ⅜-inch long, and the thickness of the stock should be ¾-inch less than the rough material. The groove in heavy matchings should be 1/16-inch wider than the thickness of the tongue, and 1/16-inch deeper than the length of the tongue. Tongue and groove shall be located ¼ the thickness of the rough material from the bottom of the piece. (See cuts on pages 36, 37 and 38.) In 2-inch and thicker material plowed for splines, the groove should be the same width and depth as is provided for in matching material of the same thickness.

Heavy Shiplap shall be worked to the same thickness as Heavy Flooring. The lap shall be ½-inch long, occupying one-half the finished thickness of the piece.

118. **Timbers** shall be worked to the following: 4x4 and larger S. 1 S. or S. & E., ⅜-inch off each face surfaced; S. 3 S. or S. 4 S., ¼-inch off each face surfaced.

118½. All sizes in Timbers are subject to natural shrinkage.

119. **Yellow Pine Plastering Lath, No. 1,** should measure 2 inches in thickness to every five lath, green; the minimum thickness of any one lath shall not be less than 5/16 of an inch, green, and should not be less than 1 7/16 inches in width, green, length 4 feet; 1⅝ inches thickness to every five lath, dry; and should not measure less than 1 5/16 inches in width, dry. Must not be more than ½-inch short in length.

120. **No. 2 Lath** must not be less than 1¼ inches in width, ¼ of an inch thick when dry, and not more than ¾-inch short in length.

121. **Byrkit Lath.** ¾x3½ and 5¼ inches wide; lengths, 4 feet and upward.

PICKETS.

122. **Square Pickets** from 1½-inch stock shall be worked to 1 5/16x1 5/16, 3 and 4 feet long, dressed on four sides and pointed. From 1¼-inch stock, shall be worked to 1 1/16x1 1/16, 3 and 4 feet long, dressed on four sides and pointed.

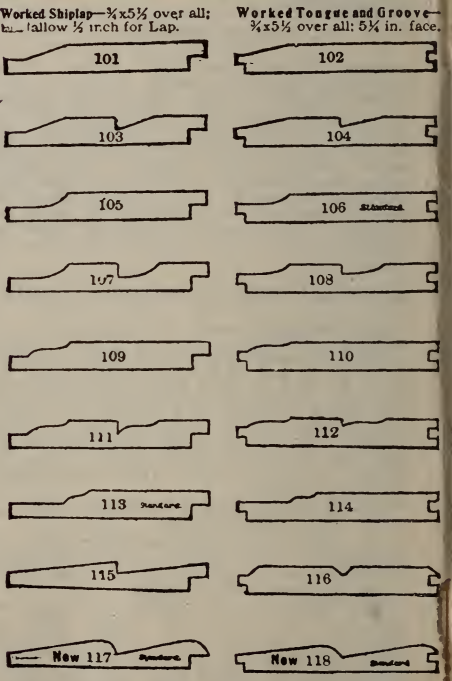
123. **Flat Pickets** from 1x3 stock, shall be worked to ¾x2¼, 3 and 4 feet long, dressed on four sides and headed.

PATTERNS OF

Yellow Pine Drop Siding

Adopted at Memphis, Tenn., Jan. 16, 1901.

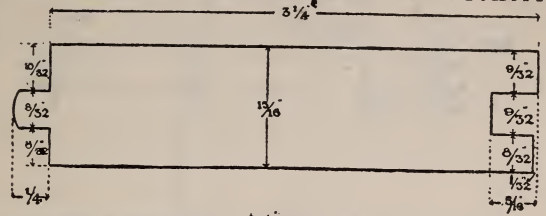
Revised at New Orleans, La., Jan. 25, 1905.



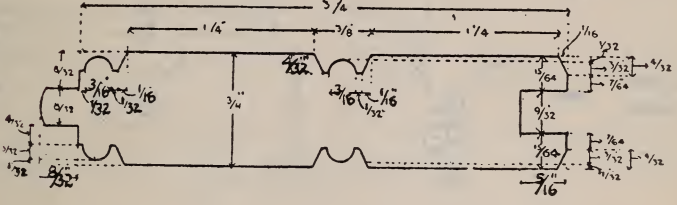
Orders for Stock Should Conform to Above Numbers

STANDARD SIZES OF YELLOW PINE FLOORING AND PARTITION

1 x 4 Flooring

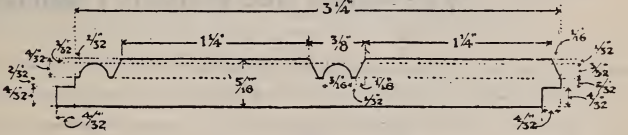


1 x 4 Partition

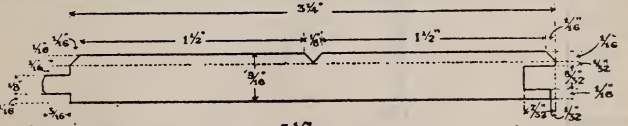


STANDARD SIZES AND PATTERNS OF YELLOW PINE CEILING

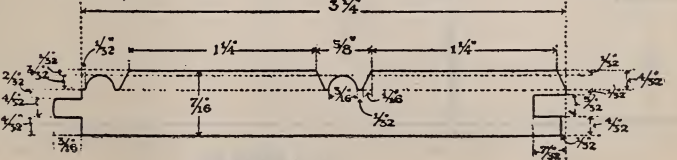
⅜ inch Ceiling. Shiplapped.



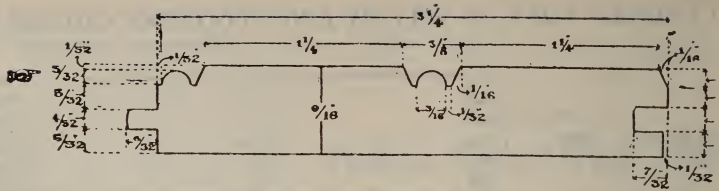
⅜ inch Ceiling. D & M.



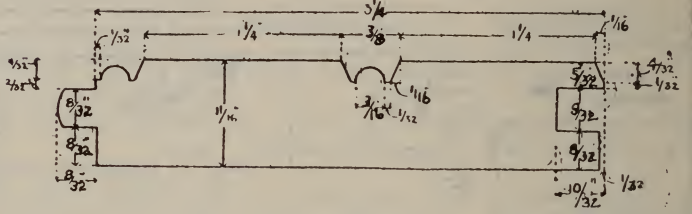
½ inch Ceiling



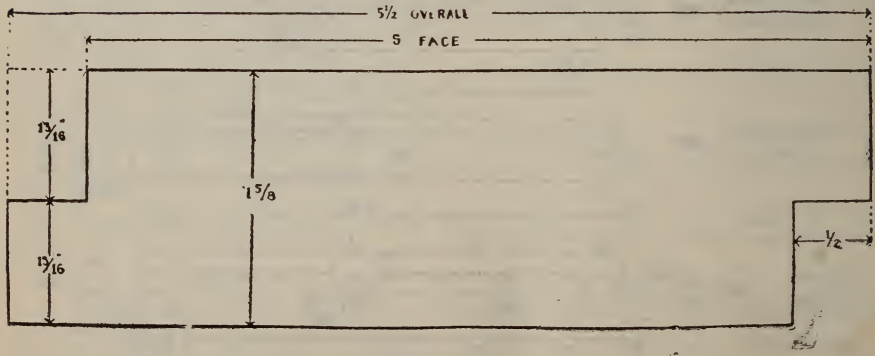
⅛-inch Ceiling.



¼-inch Ceiling

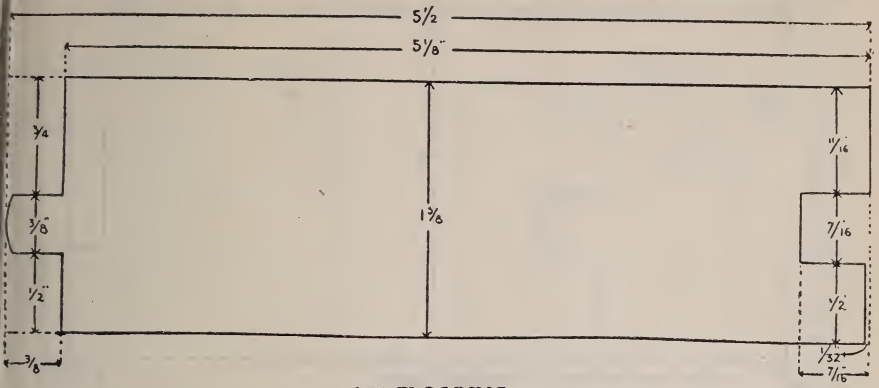


STANDARD SIZE OF HEAVY SHIPLAP.



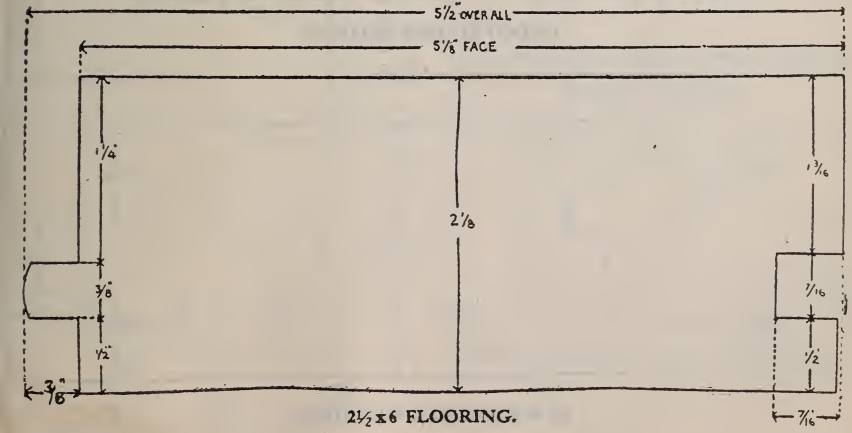
2x6 SHIPLAP

STANDARD SIZES OF HEAVY FLOORING.

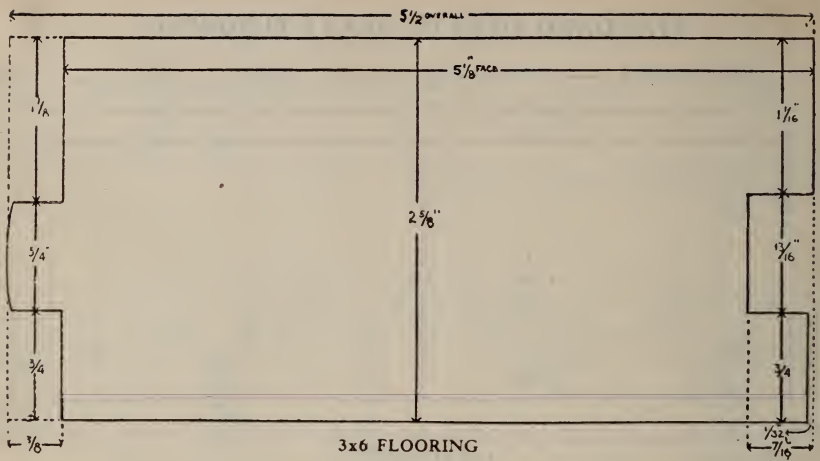


2x6 FLOORING.

STANDARD SIZES OF HEAVY FLOORING—Continued.



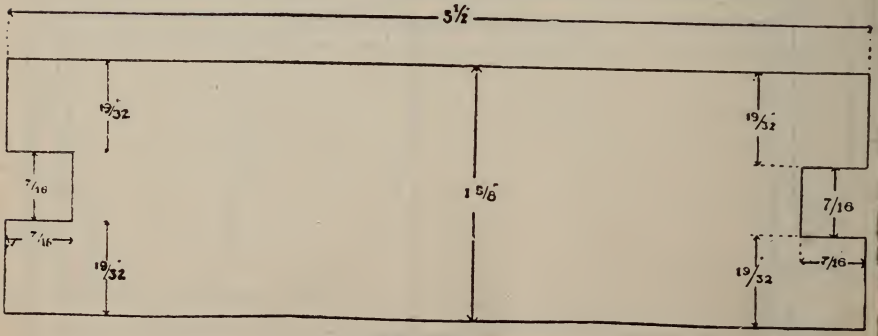
2½x6 FLOORING.



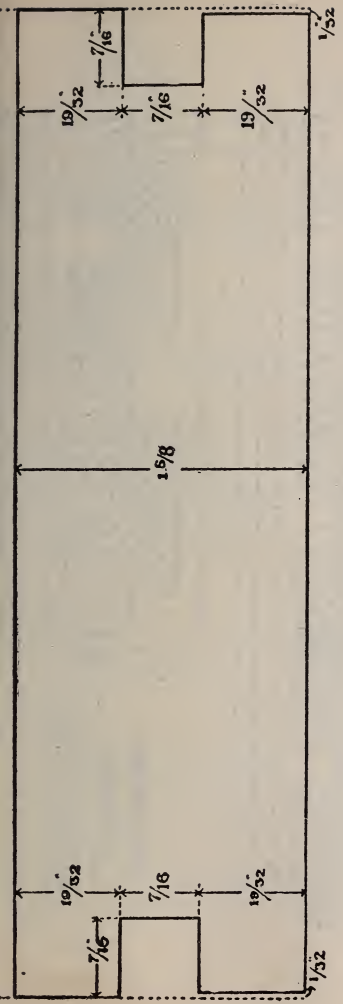
3x6 FLOORING

STANDARD SIZE OF YELLOW PINE MATERIAL.

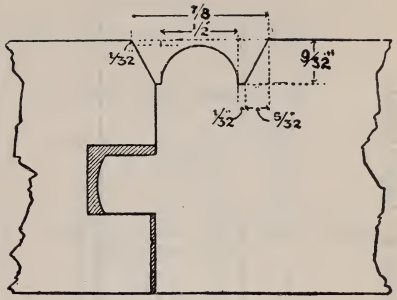
GROOVED FOR SPLINES.



IF SURFACED TWO SIDES.

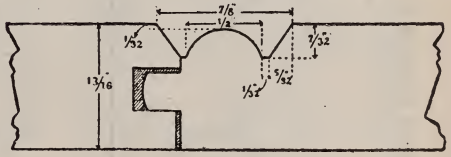


IF SURFACED ONE SIDE.



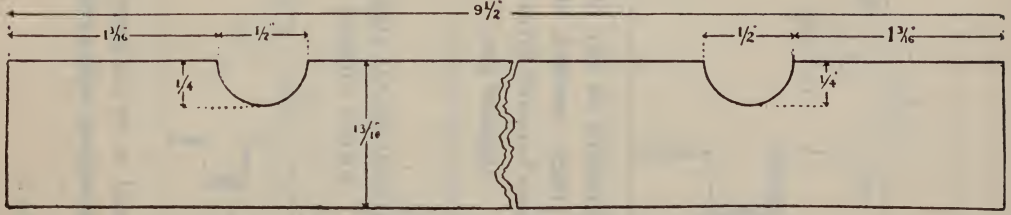
If a bead is desired on any of the foregoing thick material, the cut shown herewith gives the standard size.

STANDARD BEAD FOR 1 INCH BARN SIDING

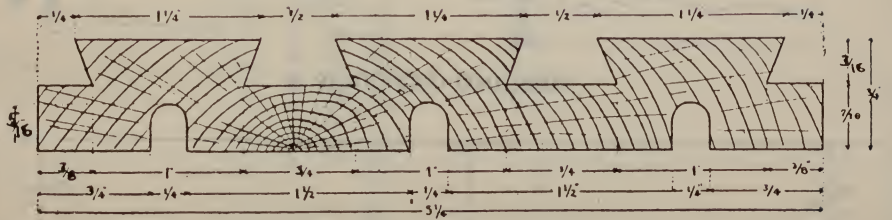


Center bead to be the same if stock is desired worked with a center bead.

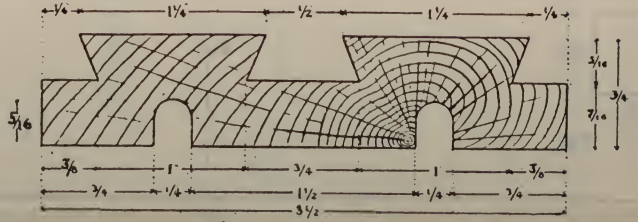
STANDARD GROOVE FOR GROOVED ROOFING.



8-inch, 10-inch and 12-inch Shiplap (standard).



STANDARD PATTERN BYRKIT LATH



THE NORTH CAROLINA PINE ASSOCIATION

Weights of

NORTH AND SOUTH CAROLINA PINE.

g leaf timbers, rough, green	4500
g leaf timbers, dressed, green	4000
rt leaf timbers, rough, green	4500
rt leaf timbers, dressed, green	4000

WEIGHTS OF LONG LEAF YELLOW PINE.

GREEN.

14 and 3 x 12, S 1 S 1 E	3800
14 and 3 x 12, rough	4500
4 and 6 x 6, S 1 S 1 E	3800
4 and 6 x 6, rough	4500
8 and over, rough	4500
8 and over, S 4 S	3800

ROUGH NORTH CAROLINA PINE.

	3100
	3350
	3500
	3500

DRESSED. NORTH CAROLINA PINE.

ooring, 13-16 x 2½ and 3 Flat Grain	2250
ooring, 13-16 x 3½ to 4½ Flat Grain	2250
ooring, 13-16 x 3 to 4 Jointed Flat Grain	2500
ooring, 13-16 x 2½ to 3½ Rift	2250
ooring, 1 1-16 x 2½ to 4½ Flat Grain	2350
ooring, 1 1-16 x 2½ to 3½ Rift	2350
eiling and Partition, 13-16 x all widths	2250
eiling and Partition, ¾ x all widths	2000
eiling, ⅝	1700
eiling, ½	1250
eiling, 7-16	1100
eiling, ⅜	1000
erman Siding, 13-16 x 5½ Face	2000
evel Siding, ½ x 4 to 6	1100
ase and Moulded Base. All patterns	2000
ase S 4 S, 13-16 x 4, 5, 6 and 7 inches	2500
ase S 4 S, 13-16 x 3 and 9 inches	2500
alls S 4 S, 2 x 3 and 2 x 4	2700
urfaced Boards, 4-4	2500
urfaced Boards, 5-4	2700
urfaced Boards, 6-4	2800
urfaced Boards, 8-4	3000
oofers, 13-16 x 4 to 9 in. face (ex. 5½ and 7½)	2400
oofers, 13-16 x 5½ in. face	2500
oofers, 13-16 x any special width under 7½	2500
oofers, 13-16 x 7½ in. face	2500
oofers, 13-16 x any width btw. 7½ and 9½	2500
oofers, 13-16 x 9½ in. face	2500
oofers, 13-16 x any width btw. 9½ and 11½	2500
oofers, 13-16 x 11½ in. face	2500
ox Bark Strips. Surfaced 1 or 2 S	2500
actory Flooring, 1½, 2, 2½ and 3 x 5 to 9 inches. To finish ¼ in. scant in thickness and ½ in. scant in width for splines, and ¾ in. scant in width, tongue and grooved	2700

OFFICIAL INSPECTION RULES OF THE NORTH CAROLINA PINE ASSOCIATION, INC.

COVERING

Kiln Dried North Carolina Pine
1911 Rules (Revised 1914.)

Air Dried North Carolina Pine
1913 Rules

Short Leaf Pine Dimensions
1910 Rules.

ISSUED BY

THE NORTH CAROLINA PINE ASSOCIATION, INC.

Norfolk, Va.

November 19th, 1914.

Official Terms of Sale.

Settlement to be made promptly on receipt of each car. Freight, net cash. Balance by note at 60 days from date of invoice or less 1½ per cent. discount for cash if paid within 15 days from date of invoice; or 1 per cent. for cash if paid within 30 days from date of invoice.

Bills are due and payable in 30 days from date of invoice.

No discount allowed after 30 days.

If car is not received within the above discount times, and discount is desired, prepayment on account will not be held as acceptance of the shipment and the right to make corrections and complaint will not be forfeited thereby. In making delivered prices, cost of goods delivered at destination is guaranteed, but not against delay in transit. The terms of sale are as binding as the price.

Claims for count or quality must be reported as soon as car is unloaded and tally proven. No claims allowed if not reported within 10 days after unloading.

To Manufacturers and Buyers of Pine Lumber:

At the present time fully 95 per cent. of the output of Pine Lumber in the States of Maryland, Virginia, North and South Carolina is graded and classified according to these grading rules, and all quotations are made on them as a basis.

Buyers are therefore urged to familiarize

themselves with these rules in order that they may know what they are contracting for when ordering and also that they may determine whether shipments are up to grade, or otherwise, before making complaints as to quality. This request, if complied with, will tend very materially to lessen complaints, and will thus prove to the mutual interest of buyer and shipper. Should any question arise not covered by rules, write to

THE NORTH CAROLINA PINE ASSOCIATION, INC.

Norfolk, Va.

RULES FOR THE CLASSIFICATION AND INSPECTION OF KILN DRIED NORTH CAROLINA PINE

ADOPTED BY

The North Carolina Pine Association

July 20th, 1911 (Effective September 1st.)
(Revised November 19th, 1914.)

1. North Carolina Pine Lumber shall be graded and classified according to the following Rules and Specifications as to quality:

2. Recognized defects in North Carolina Pine are: knots, knot holes, splits, shake, wane, red heart, pith, rotten streaks, wormy, buggy or pinny, pitch streaks, pitch pockets, torn or loosened grain, seasoning checks, sap stain or defects in manufacturing.

WIDTHS OF LUMBER.

3. Narrow Edge (also called Edge) contains all widths of lumber under 12 in., excepting 6, 8 and 10 in. stocks.

4. 4-4 No. 1, 2, 3 and Box Edge to be 3 in. wide and up.

5. 5-4 No. 1, 2 and 3 Edge to be 3 in. wide and up.

6. 6-4 and 8-4 No. 1, 2 and 3 Edge to be 5 in. wide and up.

7. All Box Edge 5-4, 6-4 and 8-4 to be 4 in. wide and up.

8. Wide Edge contains all widths over 12 in.

9. Stocks are widths of 6, 8, 10 or 12 in.

KNOTS.

10. Knots shall be classified as pin, standard and large, as to size: round and spike as to form; and as sound, tight, loose, encased, pith and rotten as to qualities.

The mean or average diameter of knots shall be considered in applying and construing the rules.

11. A pin knot is sound and not over ½ in. in diameter.

12. A standard knot is sound and not over 1½ in. in diameter.

13. A large knot is one any size over 1½ in. in diameter.

14. A round knot is oval or circular in form.

15. A spike knot is one sawn in a lengthwise direction.

16. A sound knot is one solid across its face; is as hard as wood it is in; may be either red or black, and is so fixed by growth or position that it will retain its place in the piece.

17. A loose knot is one not held firmly in place by its growth or position.

A tight knot is one that is held firmly in place by its growth or position.

18. A pith knot is a sound knot with a pith or straw hole not more than ¼ in. in diameter in the center.

19. An encased knot is one surrounded wholly or in part by pitch or bark which may show on one or both sides of the piece. If grown fast to the piece at any point, on one or both sides of the piece, or is so fixed by growth or position that it will retain its place in the piece, it shall be considered a sound knot.

20. A rotten knot is one not as hard as the wood it is in.

PITCH.

21. Pitch pockets are openings between the grain of the wood and may contain pitch or bark, or both, and shall be classified as small, standard and large.

22. A pitch pocket which shows on both sides of the piece of lumber shall be considered the same as a knot hole of equal size.

23. A small pitch pocket is one not over ⅛ of an inch wide.

24. A standard pitch pocket is one not over ⅜ of an inch wide or 3 in. in length.

25. A large pitch pocket is one over ⅜ of an inch wide or over 3 in. in length.

26. A pitch streak is a well defined accumulation of pitch at one point in the piece.

27. A small pitch streak shall be equivalent to not over 1-12 the width and 1-6 the length of the piece it is in.

28. A standard pitch streak shall be equivalent to not over 1-6 the width and 1-3 the length of the piece it is in.

29. Pitch pockets to be considered the same as knots in all grades of rough and dressed lumber.

WANE.

30. Wane is bark or a decrease in the thickness of the wood from any cause on the edge of the piece of lumber.

31. Wane, bark or other defects that will dress out in working to standard thickness and widths are admissible without deduction in measurement.

SPLITS.

32. A split is allowed in one end of a board provided length of split does not exceed width of board, except that in No. 1, 2 and 3 stocks, 8 in., 10 in. and 12 in. wide, the split shall be in lieu of one other allowable defect.

MISCELLANEOUS.

33. Bright sap shall not be considered a defect in any of the grades provided for and described in these rules. The restriction or exclusion of bright sap constitutes a class of material which can only be secured by special contract.

34. All strips or boards, either rough or dressed on two sides, shall be inspected on the best side of the piece to determine the grade. Strips or boards which are surfaced one side shall be inspected on the dressed side.

35. All lumber shall be inspected and graded as to its full length and widths unless so marked by shipper as to indicate distinctly that a portion of a board has been omitted from measurement to allow for defects.

36. In the measurement of all edge lumber fractions exactly on the one-half foot are to be given alternately to buyer and seller; fractions below the one-half foot are to be dropped and fractions above the one-half are to be counted to the next higher figure on the board rule.

37. Imperfect manufacture in dressed lumber, such as torn or loosened grain, slight skips in dressing, wane, broken knots, mismatched, insufficient tongue and groove on flooring, ceiling, drop siding, etc., shall be considered defects and will reduce the grade according as they are slight or serious in their effects on the use of the lumber.

38. Tongues of flooring, drop siding, partition and ceiling, if not over 1-16 scant, and tongues of roofers if not over ⅛ of an inch scant in width, will not be considered defects, provided not constituting over 10 per cent. of shipment.

39. Chipped grain, if not exceeding a depth of 1-16 of an inch or slight seasoning checks, shall not be considered a defect.

40. The grain of North Carolina Pine shall be classified as RIFT or FLAT. Rift is sometimes designated as Edge grain, Vertical or Quarter Sawn grain; Flat grain is sometimes designated as Slash. Rift is specially desirable for high-grade flooring, and will admit of no piece in which the angle of the grain exceeds forty-five degrees from Vertical at any point, thus excluding such pieces as would sliver or shell from wear. All Flooring which will not meet the requirements of Rift shall be known as Flat Grain.

41. Equivalent means equal, and, in construing and applying these Rules, the defects allowed, whether specified or not, are understood to be equivalent in damaging effect to those mentioned, applying to stock under consideration.

42. Lumber and timber sawed for specific purposes must be inspected with a view to its adaptability for the use intended.

43. When special patterns of dressed lumber are ordered, it will be permissible to ship all of the next lower grade that develops in its manufacture, providing this does not exceed 10 per cent. of the quantity ordered, charging for such lower grade a corresponding price.

44. Lumber must be accepted on grade in the form in which it was shipped. Any subsequent change in manufacture or mill work will prohibit an inspection for the adjustment of claims, except with the consent of all parties interested.

45. A shipment shall be considered as of the grade invoiced if upon re-inspection by an official inspector of this association it develops at least 95 per cent. of such grade, and the remainder is not more than one grade lower, such lower grade, however, to be paid for at its corresponding price.

COUNT

46. All lumber shall be counted by nominal or strip size, which is 1-2 in. wider than actual finished size in all regular patterns and standard matched flooring, ceiling and partition.

47. One-half inch width shall be allowed on factory flooring when grooved for splines, and three-quarter inch when tongued and grooved.

48. One-half inch in width shall be allowed for working moulded base and casing, except on standard patterns finished on the quarter inch or three-quarter inch, for which shall be allowed one-quarter inch.

49. One-quarter inch in addition to the width of the rabbett shall be allowed for working German Siding and Ship Lap. Unless otherwise specified, the rabbett shall be one-half inch wide.

MATCHING

50. All flooring, ceiling and partition 3-4 in. thick and over shall be dressed two sides and center matched. All ceiling under 3-4 in. thick shall be dressed one side and matched.

DRESSING

51. 1-8 in. shall be allowed to dress 4-4 and 5-4 stock and edge boards one side.

52. 3-16 in. shall be allowed to dress 4-4 and 5-4 stock and edge boards two sides.

53. 1-4 in. shall be allowed to dress 6-4 and thicker one or two sides.

54. 1-4 in. shall be allowed in dressing thicknesses of factory flooring.

GRADES OF ROUGH AND DRESSED LUMBER

55. All lumber shall be well manufactured and well dried.

56. The basis of inspection shall be the best side of each piece.

57. **No. 1 Grade,** 8 in. and under in width, shall have one side practically clear of all defects, but will admit two small pitch streaks or one standard pitch streak; the other side of the piece to grade No. 2 or better except in 6-4 and thicker reverse side may grade No. 3 or better. Lumber over 8 in. in width, in addition to the pitch streaks mentioned, may have one small pitch pocket or sound pin knot or small pitch streak for each additional 2 in. of width, the reverse side to grade same as 8 in. and under.

58. **No. 2 Grade** consists of boards with small, tight knots on the best side and will permit small pitch streaks whose combined area is less than 1-6 the area of the piece; the other side to grade No. 3 or better, except 6-4 and thicker reverse side may grade Box or better. Pieces 8 in. in width and under may have any two of the following defects or their equivalent: 3 pin knots, 3 small pitch pockets, 2 small pitch streaks. Pieces over 8 in. wide may have one of the following defects or its equivalent for each 2 in. in width over 8 in.: One standard knot, 3 pin knots, 3 small pitch pockets, 3 small pitch streaks, 1 standard pitch streak, or small seasoning checks.

59. **No. 3 Grade** shall consist of tight knotted boards below the grade of No. 2, with one edge No. 2 or better on the best side of the piece, and containing not exceeding 15 per cent. of stain. Stock boards 6 in. and over in width shall have one edge No. 2 or better, one-fourth of the width of the piece on the best side.

Pieces 6 in. and over in width will admit the following defects: Tight or sound knots not over 1-4 the width of strip, pin knots if tight or sound, pitch pockets, pitch streaks (limited as hereinafter indicated), pinny boards which would otherwise grade No. 1 or 2, No. 1 boards with 50 per cent. pitch, No. 2 boards with 33 1-3 per cent. pitch. Lumber which would otherwise grade No. 1 or 2, containing 25 per cent. Firm Red Heart, will be admitted in this grade. Lumber which would otherwise grade No. 1 and 2, and which is stained not more than 50 per cent. is admitted in this grade.

Strips under 6 in. in width may have the following defects: Tight or sound knots not over 1-4 the width of the piece, and will admit two standard knots if not located on the edge of the strip; 6 small pitch pockets; 2 standard pitch pockets, and one large pitch pocket or their equivalent; pin holes, if otherwise No. 1 and 2, 50 per cent. pitch if otherwise No. 1; 33 1-3 per cent. pitch if otherwise No. 2; 25 per cent. Red Heart if otherwise No. 1 and 2, and 50 per cent. stain if otherwise No. 1 and 2.

The reverse or poorest side of all No. 3 lumber must grade Box or better.

60. **Box Grade** shall consist of lumber below the grade of No. 3, containing pin, standard and large, reasonably sound knots, and stain not exceeding 25 per cent. and will admit pitch knots, encased knots, and spike knots which do not seriously affect strength of piece. This grade will admit pinny pieces which would otherwise grade No. 3; stained pieces otherwise No. 1 and 2 grade, which show over 50 per cent. stain, stained pieces otherwise grading No. 3 and showing not more than 33 1-3 per cent. stain, and pitchy pieces which are not desirable in No. 1, 2 and 3 grades. Lumber which would otherwise grade No. 1, 2 and 3, containing 50 per cent. Firm Red Heart, will be admitted to this grade.

61. **Culls.** This grade shall consist of boards below the grade of Box (excepting Red Heart or Bark Strips) and which can be used with a waste not exceeding 25 per cent. and may contain 50 per cent. Firm Red Heart, except that 8, 10 and 12 in. shall crosscut sound in the widths for which they are shipped within the above limit of waste.

62. **Merchantable Red Heart.** This grade shall consist of Red Heart boards which may be used with a waste of not exceeding 25 per cent., except that 8, 10 and 12 in. shall crosscut sound in the widths for which they are shipped within the above limit of waste.

63. **Cull Red Heart.** This grade shall consist of all Red Heart below the grade of Merchantable Red Heart, cutting up with

not more than 50 per cent. waste, except that 8, 10 and 12 in. shall cross cut sound in the widths for which they are shipped within the above limit of waste.

64. **Shop Lumber.** No. 1 Shop shall consist of boards 4 inches and over wide, 8 feet and over long, which will develop 60 per cent. or better of cuttings or rippings, or both.

No. 2 Shop, same as No. 1. Shop, except the percentage of cuttings and rippings shall be 40 per cent. or better.

65. **No. 1 and 2 Back Strips.** This grade shall consist of lumber containing bark, 90 per cent. of each lot inspected to show not less than 1-2 in. of wood on both edges, from end to end of piece, while admitting not over 10 per cent. showing less than 1-2 in. of wood on edges, provided face is 75 per cent. clear of bark or wane, and to be otherwise equal to the grade of No. 1 and No. 2 lumber.

66. **Box Bark Strips.** This grade shall contain all bark strips falling below the description of No. 1 and 2.

67. **Standard Lengths of Rough Lumber:** 8 to 16 feet, not exceeding 5 per cent. of 8 ft. lengths.

68. The standard thickness of 4-4, 5-4, 6-4, 7-4, 8-4, 10-4 and 12-4 rough lumber is 1 in., 1 1-4 in., 1 1-2 in., 1 3-4 in., 2 in., 2 1-2 and 3 in., respectively, but 25 per cent. may be 1-16 in. scant.

69. **Thin Boards** are those cut thinner than required in standard thickness of 4-4 lumber, but will dress two sides to 5-8, and may be graded the same as standard thicknesses.

FLOORING

70. **Lengths.** Standard lengths are from 8 to 16 feet, in multiples of one foot, not to exceed 5 per cent. of 8 and 9 ft. lengths.

71. **Grades.** No. 1, 2, 3 and 4 (meaning flat grain unless otherwise specified) and No. 1 and 2 Rift.

72. **No. 1 Flooring.** Must be practically free from defects on the face side, well manufactured and grade No. 4 or better on reverse side.

73. **No. 2 Flooring.** (See No. 2 grade). Must be well manufactured, and reverse side to grade No. 4 or better.

74. **No. 3 Flooring.** (See No. 3 grade).

75. **No. 4 Flooring.** This grade shall consist of all flooring below the grade of No. 3 and that can be laid without wasting over 25 per cent. of any one piece.

CEILING

76. **Lengths.** Lengths 6 ft. to 16 ft. in multiples of 1 ft., not to exceed 5 per cent. of 6 and 7 ft. lengths.

77. **Grades.** No. 1, 2, 3 and 4.

78. **No. 1 Ceiling.** Must be practically free from defects on the face side, well manufactured and reverse side to grade No. 4 or better.

79. **No. 2 Ceiling.** (See No. 2 grade). Must be well manufactured and reverse side to grade No. 4 or better.

80. **No. 3 Ceiling.** (See No. 3 grade).

81. **No. 4 Ceiling.** This grade to consist of all ceiling below the grade of No. 3 and that can be laid without wasting over 25 per cent. of any one piece.

PARTITION

82. **Lengths.** Standard lengths same as in ceiling.

83. **Grades.** No. 1, 2, 3 and 4.

84. Partition shall be graded according to the Rules for Flooring and Ceiling, but the reverse side shall not be more than one grade lower than the face side.

FENCING

85. **Lengths.** Standard lengths same as partition.

86. **Grades.** No. 1, 2, 3 and 4.

87. Fencing shall be graded the same as Partition, the reverse side being only one grade lower than the face side.

BASE AND CASING

88. **Lengths.** Standard lengths same as ceiling.

89. **Grades.** No. 1 and 2.

90. Base and casing shall be graded same as flooring and ceiling, excepting the edges shall not be of lower grade than the face, but the reverse side or back may be No. 4 or better.

GERMAN, BEVEL AND DROP SIDING

91. **Lengths.** Standard lengths same as ceiling.

92. **Grades.** No. 1, 2, 3 and 4.

93. Siding to be graded in the same manner as flooring and ceiling.

RAILS

94. **Lengths.** Standard lengths same as flooring.

95. **Grades.** No. 1 and 2.

96. Rails to be graded same as base and casing.

MOULDINGS

97. **Lengths.** Standard lengths same as ceiling.

98. Grades. No. 1.
99. Mouldings are manufactured in one grade, unless by special contract.
100. No. 1 Mouldings must be practically free from defects and well manufactured, but will admit 10 per cent. No. 2 grade.

FACTORY FLOORING AND ROOFERS

101. Lengths. Standard lengths same as flooring.
102. Grade same as Box lumber.
103. Unless otherwise specified, factory flooring and roofers shall be worked tongued and grooved.

STANDARD GAUGES

104. The following are the standard matchings adopted by this Association for ceiling, flooring, partition, factory flooring and spline:

1913 RULES FOR THE CLASSIFICATION AND INSPECTION OF AIR-DRIED NORTH CAROLINA PINE

Adopted by
The North Carolina Pine Association
February 13th, 1913

Air-Dried North Caroline Pine Boards in thicknesses of 2 inches and under, and in lengths of 8 feet and over (in multiples of 2 feet), shall be graded and inspected as follows:

No. 1. Same as Kiln-dried (Rule 57).

No. 2. Same as Kiln-dried (Rule 58), but admitting stain not exceeding 25 per cent.

No. 3. Same as Kiln-dried (Rule 59), admitting 50 per cent. stain.

Box. Same as Kiln-dried (Rule 60), but admitting 75 per cent. stain.

Culls. Same as Kiln-dried (Rule 61), but admitting 100 per cent. stain.

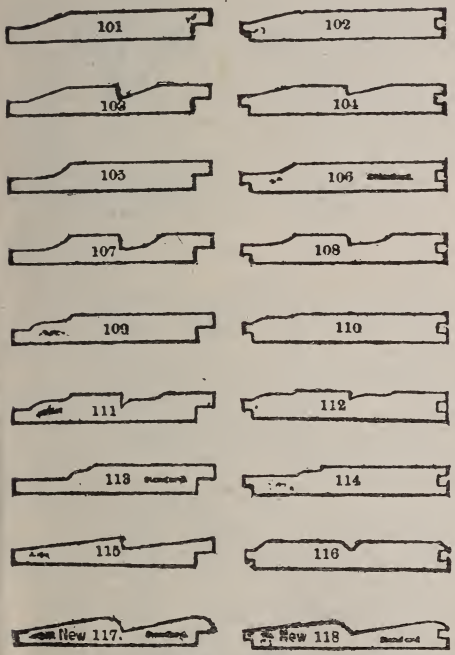
NOTE.—By "stain" in above rules is meant the usual blue sap stain. Weather stain, which is superficial, and will be removed by the usual dressing, is not to be considered a defect.

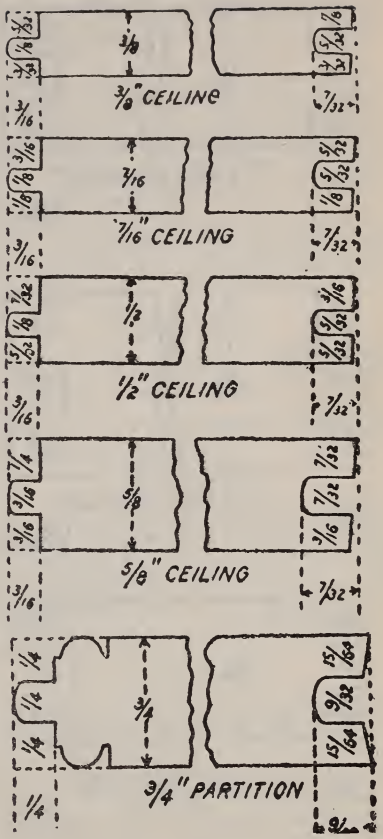
VA. PINE FRAMING. Shall be merchantable lumber, and shall be free from such defects as would prevent its use for ordinary building purposes; a small amount of Red Heart allowed. When a sufficient defect appears on the end of a piece, it must be reduced to the next regular length.

PATTERNS OF

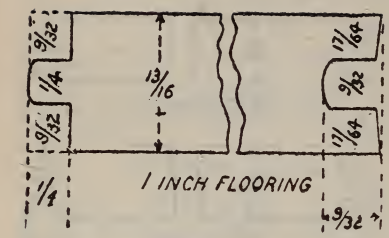
N. C. Pine German Siding

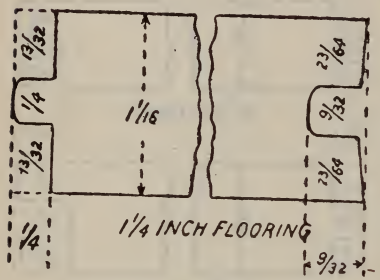
Worked 13-16 x 5½ inch face. When ordering ship lap, always specify size of rabbet

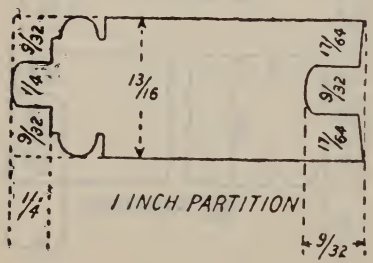


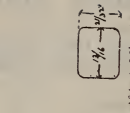


Orders for Stock Should Conform to above Numbers.

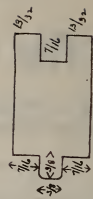




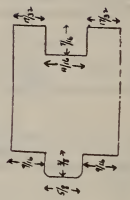




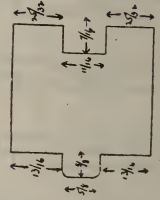
Standard Spline for 2, 2 1 and 3 in Factory Flooring



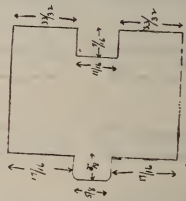
3 1 inch T. and G. Factory Flooring



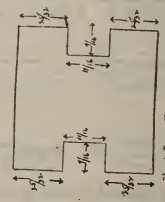
2 inch T and G Factory Flooring



2 1 inch T. and G. Factory Flooring



3 inch T and G Factory Flooring



2 1 inch Factory Flooring Grooved for Splines

GRADING TIMBER ON THE STRENGTH BASIS

Important Innovation Introduced by Yellow Pine Manufacturers To Establish a Satisfactory Means of Determining Grades

BY A. T. NORTH*

Heretofore the grading of timber has been confined to establishing the maximum permissible defects for each grade. There is a demand at present that timber be graded primarily on a basis of strength quality and that secondary consideration be given to the effect of defects and the permissible amount of the same. Timber is divided into groups by arbitrary lines of division and this is necessary because, as with all natural products, the material is not uniform. Therefore each grade is based on a minimum strength quality with a maximum of defects. This lack of uniformity in the material makes it necessary to have several grades for the same kind of timber.

The woods commercially available for structural use are confined to the conifers and of these the southern yellow pines furnish the bulk of the timber cut, with Douglas fir and the softer northern pines secondary in the order given.

Investigators of the mechanical properties of coniferous woods agree on the following laws which are quoted from the Forest Service bulletin No. 108.

"(1) The mechanical properties of timber beams are dependent upon (a) the quality of the wood irrespective of defects; (b) the character and location of defects.

"(2) The mechanical properties of wood free from defects vary directly with its dry weight. The relative dry weight of the different pieces of wood of any species can be approximated by comparing the proportion of summerwood in each.

"(3) The only defects which materially decrease the breaking strength of timber beams are the more serious ones, such as large knots and cross grains occurring where fibres are subjected to comparatively high stress.

"(4) All the species tested seem to be subject to the same general laws regarding the relation of mechanical to physical properties."

The grade of timber must of necessity be determined by visual inspection, owing to the lack of uniformity of the material. The cost of making an exact determination of the dry weight of each piece would be prohibitive, as it would be if each and every bag of cement were tested. Cement, being a mechanical product, is uniform and visual inspection is of no value. In timber we can see the physical characteristics and the defects, and easily determine the soundness of the material.

It is the heavy dry weight which makes the southern yellow pine the strongest of the coniferous woods and its high percentage of resinous content makes it the most desirable of the strong woods. For this reason it is the standard with which all other woods are compared.

The best known species of southern yellow pine are the loblolly, shortleaf and longleaf pines. The Cuban pine is not much known, as such, it being commonly grouped with the longleaf pines. It grows along the Gulf coast and owing to the soil and climatic conditions it has larger annular rings than the longleaf and is stronger as shown by circular No. 12, division of forestry.

The illustrations showing the range of the physical characteristics of the first three species mentioned are made from photographs furnished by the Forest Products Laboratory at Madison, Wis.

Loblolly Pine

Figure 1.—This specimen is the weakest grade, due to its having very wide rings and to the very small percentage of summerwood.

Figure 3.—This is an ordinary quality owing to the low percentage of summerwood and the wide rings.

Shortleaf Pine

Figure 4.—This is an illustration of the variation in this species, the specimen at the left having an average of eight rings per inch, with about 20 per cent of summerwood, and the other having an average of thirteen rings per inch with probably 50 per cent of summerwood.

Figures 5 and 6 also show the variation in this species.

Longleaf Pine

Figure 7.—These are very typical specimens of this species, close ringed with a large percentage of summerwood. The eccentricity of

*An address delivered recently before the Western Society of Engineers, reproduced by courtesy of the Lumber World Review, of Chicago. Readers should bear in mind that this address was delivered before a United States Association and make allowance for a few comparative references to Douglas fir, etc., with which they may not be inclined to agree.

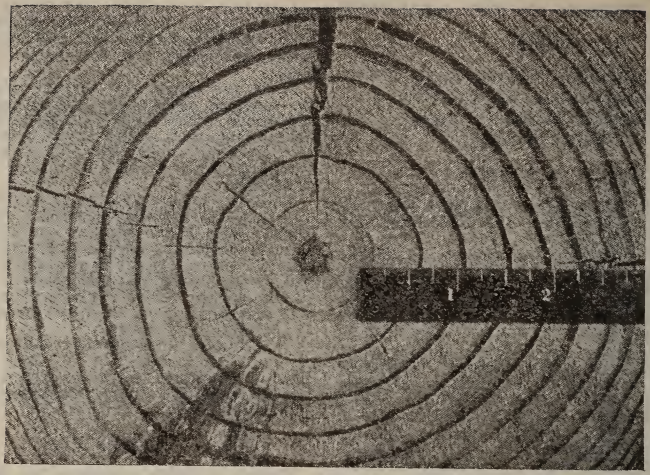


Fig. 1.—Loblolly Pine of the weakest grade, showing the wide rings and small percentage of summerwood.

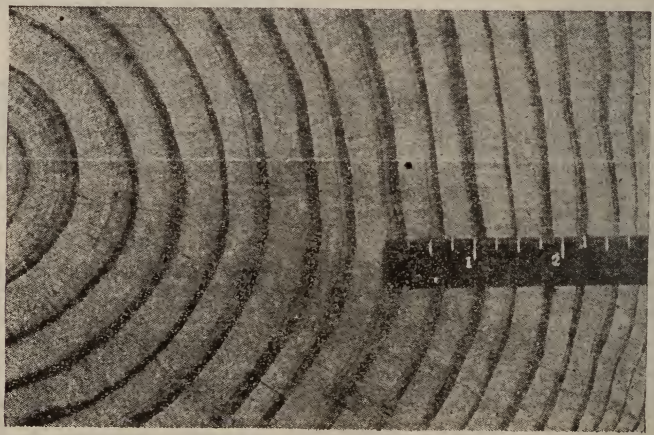


Fig. 3.—Loblolly Pine of the ordinary quality owing to the low percentage of summerwood and the wide rings.

the heart centre is notable. J. W. Martin, of Ludington, La., states that this condition is found in trees that are inclined and that the longer radius and the larger roots are always on the upper side of the tree with reference to its inclination. Here is also shown the very small percentage of sapwood characteristic of this variety. The preceding statement concerning season checks is here verified.

Figure 8.—Referring to Figures 2, 5 and 6 in connection with this figure, it is apparent why the counting of rings should be started at some distance from the heart centre, the scale in this case starting 2¼ inches from that point. This specimen would run probably 20 per cent of summerwood with an average of 12 rings per inch.

Figure 9 is a specimen showing regularity of ring widths, with unevenness of summerwood, owing to climatic conditions.

Figure 10 shows an unevenness of ring widths with a very large proportion of summerwood, ranging from 50 to 75 per cent.

These few illustrations will demonstrate the impossibility of determining the botanical variety of these woods after they are manufactured into timbers. Microscopic examination also fails in this regard.

In 1909, Committee Q of the American Society for Testing Materials presented a progress report on a method of determining the botanical species based on the average number of rings per inch measured over at least 5 inches across the face of the stick. This committee recommended that wood having 15 rings or more per inch be considered longleaf pine; 8 to 15 rings per inch shortleaf pine; any timber having less than an average of 8 rings per inch shall be considered so porous that it is unfit for structural purposes. This finding was based on measuring a large number of trees but not on a sufficiently wide range of soil and climatic conditions to be of value. (See report of the twelfth annual meeting, 1909, American Society for Testing Materials.) Climatic and soil conditions have a very important effect on the annual growth of the trees and a longleaf pine grown in southern Louisiana will look very different from one grown on the hills of central Alabama. It is apparent that this scheme of determining botanical species is not practical. The American Society for Testing Materials has never voted on or adopted any recommendation appertaining to this matter, although such an opinion prevails.

The number of rings per inch, with no other qualifications, is not indicative of anything other than the mere fact that this number exists. It serves, however, when considered in connection with the percentage of summerwood, as an index of the dry weight of the

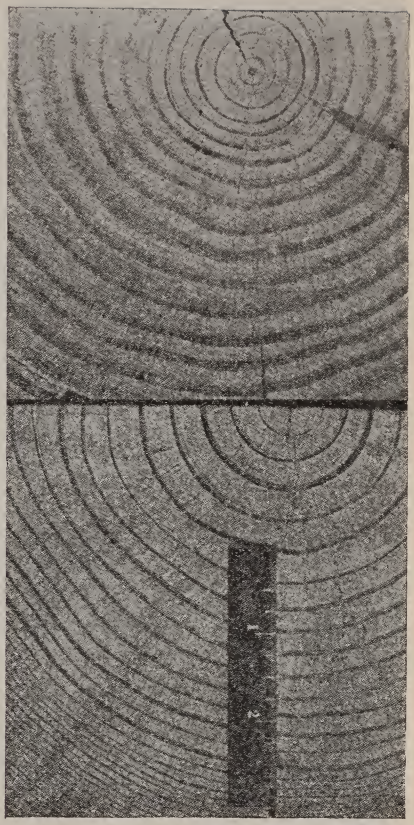


Fig. 2.—Loblolly Pine showing other specimens of the wide ring variety.

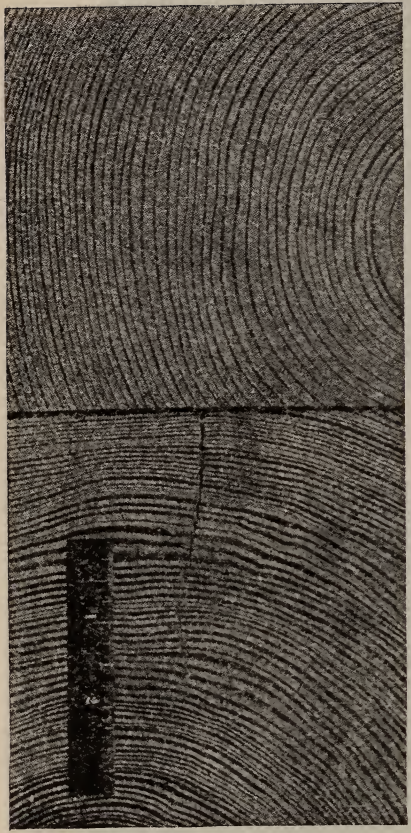


Fig. 4.—Shortleaf Pine, showing the variation in the species.

timber which has a direct relation to its strength quality.

That there is an appreciable overlapping of the species is shown in Circular 15, division of forestry, wherein it appears that "the average highest 10 per cent of tests" on shortleaf and loblolly pine exceeded the average of all tests on longleaf pine by 14 per cent. This would show that a strict botanical classification would exclude much of the better grade of shortleaf pine which is superior to the "average lowest 10 per cent of tests" on longleaf pine.

The next public appearance of the rings per inch scheme is in Bulletin No. 108, Forest Service, issued September 23, 1912, which was preceded by Circular No. 189 in form of an advance report. From page 11, under topical heading of "southern yellow pine," is quoted: "The term 'southern yellow pine' is applied collectively to practically all of the pines of the southern states which are manufactured into lumber. On the market the manufactured lumber is divided into two classes, longleaf and shortleaf. Material with more than 8 or 10 rings per inch, and containing a comparatively large amount of summerwood and less than 30 per cent of sapwood, is called longleaf pine; while material with fewer than 10 rings per inch, slow-growing material that is light in weight and which contains much sapwood, is called shortleaf pine. Commercially, therefore, the terms 'longleaf' and 'shortleaf' are descriptive of quantity and have little botanical significance." This paragraph has a footnote reading: "See 'standard specifications for structural timbers,' American Society for Testing Materials." This is a very misleading statement. The "standard classification of structural timber, adopted September 1, 1907, reads: 'Southern Yellow Pine.'—Under this heading two classes of timbers are used, (a) longleaf pine, (b) shortleaf pine. It is understood that these two terms are descriptive of quality, rather than of botanical species. Thus, shortleaf pine would cover such species as are now known as North Carolina pine, loblolly pine and shortleaf pine. 'Longleaf pine' is descriptive of quality, and if Cuban, shortleaf or loblolly pine is grown under such conditions that it produces a large percentage of hard summerwood, so as to be equivalent to the wood produced by the true longleaf, it would be covered by the term 'longleaf pine.' " There is no mention of "rings per inch" but it accepts the best grades of the shortleaf, Cuban and loblolly pines as equal to the longleaf variety.

The quotation from Bulletin No. 108, above referred to, gave birth to a large number of specifications promulgated by various persons, corporations and proposed building codes. To

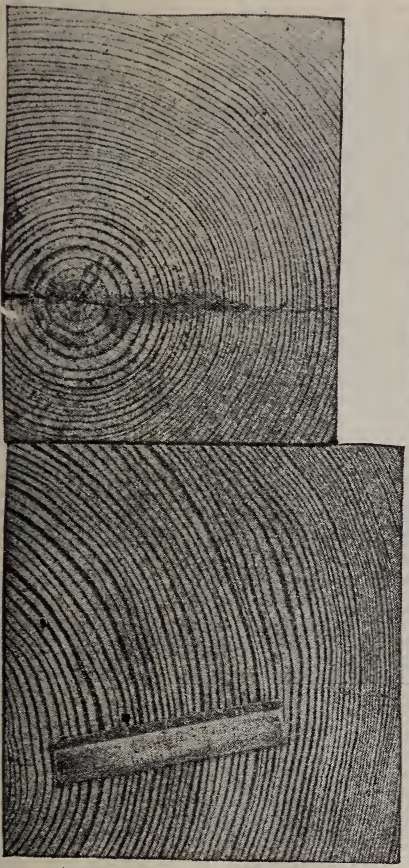


Fig. 5.—Shortleaf Pine, showing further variations of species.

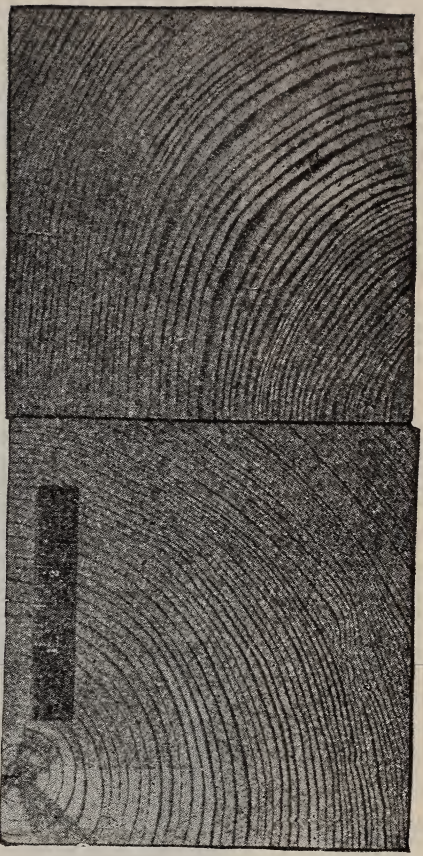


Fig. 6.—Shortleaf Pine, showing further variations of species.

an engineer the words "comparative" or "comparatively large amount of hard summerwood" appear ridiculous when applied to a quantity that can be measured by volume, weight or otherwise, and such a phrase incorporated in a specification or building code would only result in disputes and litigation.

On page 60 of this same bulletin is found a tentative grading rule consisting of a set of definitions and rules which can be applied to the grading of structural timbers cut from any of the species discussed in that bulletin, these species being: longleaf pine, shortleaf pine, loblolly pine, Douglas fir, western larch, tamarack, western hemlock, redwood, Norway pine, red spruce and white spruce. It will be noted that the Forest Service proposes to apply a ring rule to all of the woods above mentioned, but this idea is not get generally accepted.

This tentative grading rule, considered aside from the permissible defects, is based on a definition of "dense wood" which is required in both grades. This quality, dense wood, is defined as:

1.—Wood that shows more than eight rings per inch, or the rings of which contain more than 30 per cent of summerwood.

2.—Wood which is resilient; that is, which when struck with a hammer or similar blunt instrument, gives a sharp, clear sound, while the hammer shows a marked tendency to rebound and the wood to recover from the effects of the blow.

These properties are to be judged from an inspection of the cross section of the timber.

Without discussing the permissible defects in these grades, it can be said that these rules are the first to define the location of defects. For this purpose the timber is divided into three volumes or zones. What is termed volume 1 is the lower quarter of the middle half. or the zone affected by tension; volume 2 is the upper quarter of the middle half, or the zone affected by compression; volume 3 is the balance of the stick, or the zone containing the neutral axis and affected by horizontal shear, compression perpendicular to the grain at ends and vertical shear. The consideration given to the location of defects in this rule is a notable advance in the formulating of such rules.

A recent purchase of yellow pine timbers for the Panama Canal was based on the following rule:

Quality No. 1: In large dimension or timbers there must show on the cross section at least six annual growth rings between the third and fourth inch measured from the heart centre or pith; however, wide ringed material will be acceptable provided that in the greater number of the annual rings the dark ring is hard and in width equal to or greater than the adjacent light colored ring.

In small dimensions material (up to 4x6's) where strength and durability are the prime considerations, there must be an average of six rings per inch over the entire cross section of the piece.

Quality No. 2: Yellow pine not meeting above specifications.

This rule was devised by O. T. Swan, in charge of industrial investigation, Forest Service, Washington, D. C. Concerning this rule, Mr. Swan states that it originated in a dispute between the Panama Canal inspectors and contractors over a cargo of longleaf pine sold under the Gulf Coast rules. There was a decidedly wide range in the quality of the material delivered and to settle the dispute the Forest Service was called in. By applying the rule above given, the matter was handled to the satisfaction of both parties. Later the rule was tried out in company with inspectors of the Pennsylvania railroad and the Boston Elevated railroad upon material on the different docks and was found to classify material in a way satisfactory for their purposes. Botanists connected with the Forest Service later made further investigations in the woods to afford an additional check on the rule.

The latest development in these matters was the adoption of a rule by the classification committee of structural material of the Yellow Pine Manufacturers' Association on May 4. The board of directors of this association approved the rule and it will be tentative until passed on by the association at its semi-annual convention in July.

There are two grades provided for and called "select structural" and "No. 1 structural."

Select Structural Grade: All timber shall be sound and sawed to standard sizes, dense, free from such defects as ring shake showing on the faces, injurious cross grain, unsound knots and decay.

Stringer forms must not have encased or large sound knots in volume 1; must not have large encased knots in volume 2, or unsound knots in volume 3. Beam, post, sill and other forms may have sound knots or hard, firm encased knots, the aggregate diameter of which does not exceed the width of the face they are in; but no one knot shall exceed 4 inches in diameter; stringer forms shall show three-quarter heart at any point on the narrow faces and post; beam and sill and other forms more nearly square shall show three-quarter heart on all faces at any point.

The measurement of knots shall be at right angles with the grain of the knot.

No. 1 Structural: Shall include timber answering in all respects to select structural,

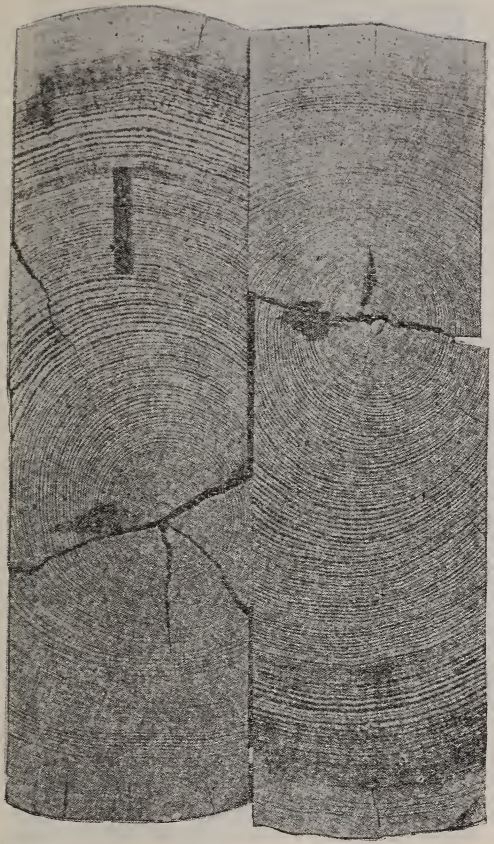


Fig. 7.—Longleaf Pine; typical specimens, with close rings and a large percentage of summerwood.

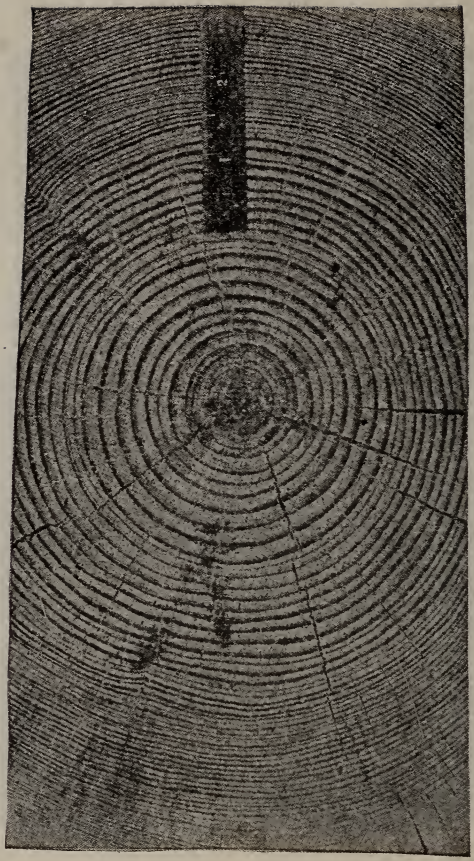


Fig. 8.—Longleaf Pine; this specimen would run about twenty percent of summerwood.

except that a greater proportion of sap or no restriction as to sap will be allowed, making timbers suitable for treatment and distinguishing them from No. 1 common timber.

In the above rule dense wood is defined as follows: Having the following characteristics showing on the cross-section and appearing in the third, fourth and fifth inches of a radial line from the pith or heart centre; an average of six or seven rings, provided that in the greater number of rings one-fourth or more of the ring is summerwood; an average of six or seven rings, provided that in the greater number of the rings one-third or more of the ring is summerwood; or wider ringed material if in the greater number of rings one-half or more of the ring is summerwood; must show a sharp contrast in color between springwood and summerwood.

It is believed that this rule will supply the proper proportion of summerwood in the various combinations given to give a uniformly strong and durable wood. It is essential that the summerwood be dark in color showing a strong contrast with the springwood. In specimens where the summerwood is light in color it is found to be light in weight and consequently lacking in strength.

The increasing of the proportion of the summerwood in the wider ringed material is made necessary by the fact that this quicker growth material is generally more brittle and less strong than the closer ringed material.

This rule combines the inclusion of the wide ringed material as incorporated in the specification for the Panama Canal timbers and the location of defects as included in the tentative rule given in Bulletin No. 108.

This is the first rule promulgated by an association of producers which attempts to grade structural timbers for building purposes on a basis of strength quality, and is also the first rule that defines the location of defects in a scientific manner.

The classification committee of structural material of the Yellow Pine Manufacturers' Association consists of M. B. Nelson, chairman; I. H. Fetty, C. E. Slagle, W. J. Haynen, J. H. Eddy and J. W. Martin. They had the earnest and active assistance of Geo. K. Smith, secretary of the association; John A. Newlin, engineer in charge of timber tests, Forest Products Laboratory, Madison, Wis.; O. T. Swan, in charge of industrial investigation, Forest Service, Washington, D. C., and the writer. It represents the combined offerings of the practical woodsman, the lumber producer, the scientific investigator and the engineer.

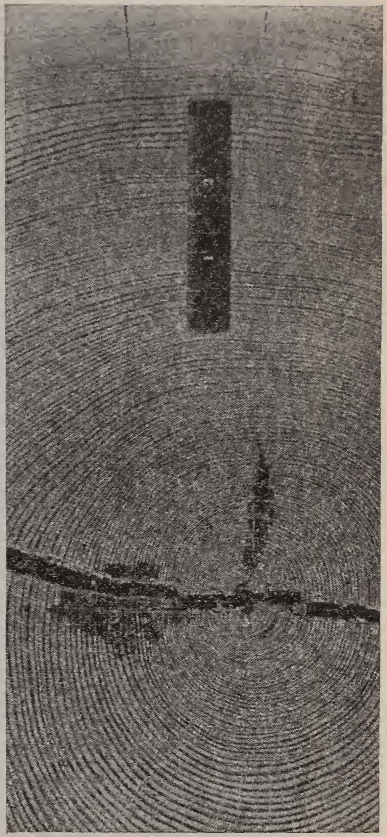


Fig. 9.—Longleaf Pine; a specimen showing a regularity of ring widths.

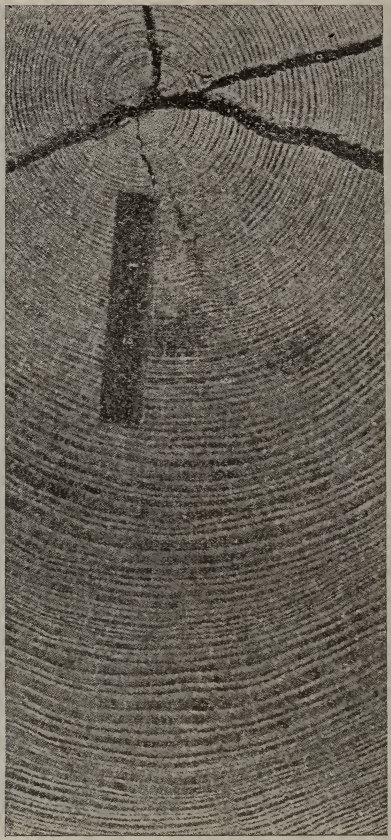
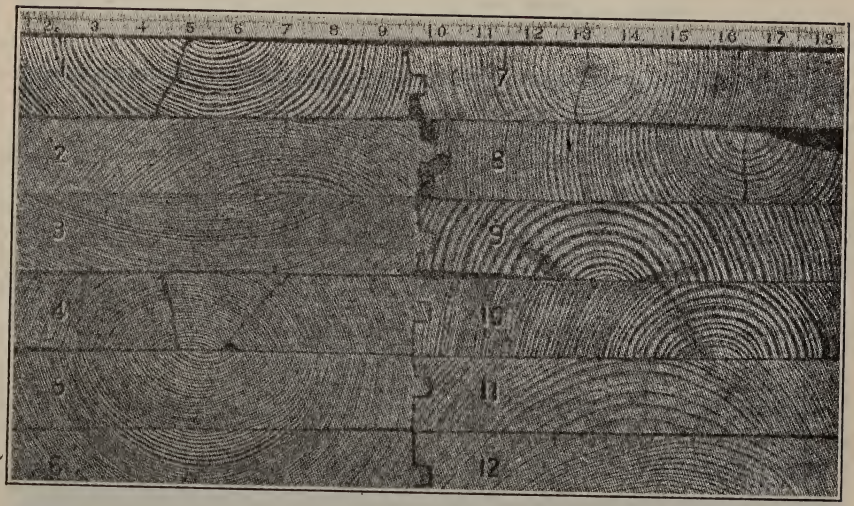


Fig. 10.—Longleaf Pine; a specimen showing an unevenness of ring widths.

Fig. 1—High grade longleaf yellow pine timber 12x15 inches, of nearly uniform density, although the annual rings vary greatly in width, showing there is no important relation between rapidity of growth and density of wood.



Pine plank for a paper mill roof. Scale one-sixth natural size. Probably all longleaf pine but containing wood varying from 42 pounds per cubic foot and 5.6 per cent. rosin (No. 1) to 26 pounds per cubic foot and 3 per cent. rosin (No. 7). Showing the need of a system of grading by which the heavy resinous material can be separated from that which is light and porous, and each applied to its proper use, suitable antiseptic treatment being given to the lighter material if the use requires resistence to decay. The density and resinous quality of these planks shown is as follows:

1.	42 lbs. per cu. ft.	5.6% rosin.	7.	26 lbs. per cu. ft.	3.0% rosin.
2.	33 lbs. per. cu. ft.	2.5% rosin.	8.	35 lbs. per cu. ft.	1.2% rosin.
3.	28 lbs. per cu. ft.	1.8% rosin.	9.	40 lbs. per cu. ft.	7.9% rosin.
4.	41 lbs. per cu. ft.	2.4% rosin.	10.	47 lbs. per cu. ft.	2.8% rosin.
5.	38 lbs. per cu. ft.	6.2% rosin.	11.	31 lbs. per cu. ft.	1.6% rosin.
6.	42 lbs. per cu. ft.	6.9% rosin.	12.	31 lbs. per cu. ft.	2.3% rosin.

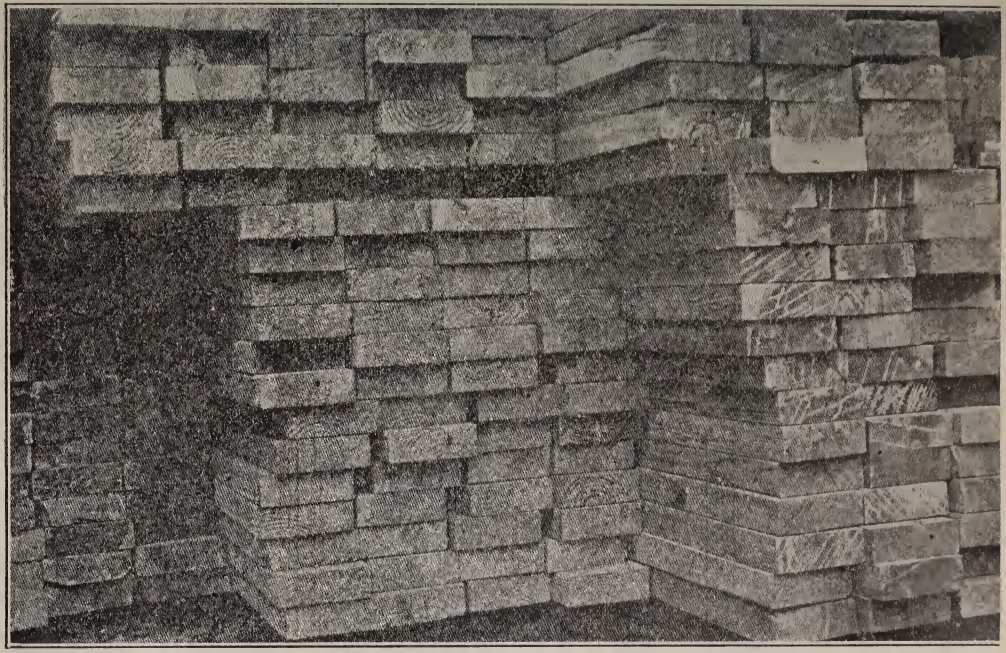


Fig. 3.—The Few Pieces of Shortleaf and Longleaf in This Pile by Comparison Shine Like a Good Deed in a Naughty World.

THE WHITE PINE ASSOCIATION OF THE TONAWANDAS

White pine has always been acknowledged as the best of all woods for every place and every purpose. As far back as records go in this country it has stood at the head for durability and ease of working. In recent years the impression has gained ground that white pine was so scarce and hard to get that users, while admitting its superiority, have accepted substitutes. While its cost has increased, owing to the more remote districts producing it, the Tonawandas are easily able to disprove the statement that white pine is hard to get.

Situated at the foot of the Great Lakes, with all the North and West its tributaries, these twin cities can supply promptly all demands of the East.

Hundreds of millions of feet of white pine are always in pile, planing mills and box factories are always running. The Eastern dealers profit by being able to carry minimum stocks when doing business in this market of quick deliveries. More as well as more uniform grades are made in Tonawanda than any other lumber center.

The following is not a specification, but is a description of the grades as made as nearly as possible.

No technical specification of Tonawanda grades can be made, as the line between is not absolute, and what are known as "Liners" are intended to be evenly divided, an equal number of pieces being put in the upper and in the lower grade. Again, the character of the lumber influences the quality of the grades, and the inspector's judgment is expected to govern. In other words, when the lumber runs good, the "Liners" are put up, and when the lumber runs poor, the "Liners" are put down, thereby endeavoring to keep the grades even. It must always be remembered that wider and thicker lumber will take larger defects than narrow stock.

The range of values given is merely approximate, varying in different localities and with supply and demand. It is given merely as a guide to the builder or architect in making his selection.

DESCRIPTION OF GRADES OF NORTHERN WHITE PINE LUMBER AS MADE IN THE TONAWANDAS

UPPERS

Highest grade of White Pine made in this market, consisting of 1st and 2d Clear, 8 in. and wider, 10 to 16 ft. long, 1st Clear being strictly clear both sides, 2d Clear admitting of slight sap on edges or ends of piece or one or two pencil knots.

Uses

Suitable for pattern purposes, organ and piano building or any place where practically clear lumber is required.

SELECTS

The second grade of White Pine, put up 8 in. and wider, 10 to 16 ft. long and what is known as 3d Clear, admitting of a slight amount of sap and an occasional pin knot, varying in number and size according to the width and thickness of the piece.

Uses

Suitable for the same purposes as uppers where slightly greater defects are admitted.

Value

About $10 per M. less than uppers.

FINE COMMON

The 3d grade of White Pine is put up 8 in. and wider, 10 to 16 ft. long, admitting of bright sap, covering half of the face of the board, some stain on back and occasionally a little running over on one or two edges. Admits of a few small pencil knots, varying in size and number according to the width and thickness of the piece. Practically free from shake, but admitting of slight shake showing only on one side or one end of piece. The grade is usually free from stain.

Uses

Suitable for high-grade finishing lumber, for exterior and interior work requiring practically clear face stock.

Value

About $15 per M. less than Selects.

No. 1 CUTS

Put up 6 in. and wider, 10 to 16 ft. long. This grade is put up with a view of cutting good sized sections of Clear Lumber and must cut 66 2-3 per cent. or more clear, except bright sap in reasonable length sections. This grade is not intended for use in the full length of the board, but cuts up exceptionally well for pattern lumber, shop

use or any purpose where Clear Lumber is wanted.

Uses

Suitable for making patterns, door and trim factories and general cutting up purposes.

Value

About $12 per M. less than Fine Common.

No. 2 CUTS

Graded the same as No. 1 Cuts, except that the percentage of cutting required is from 50 per cent. to 66 2-3 per cent. in somewhat shorter sections.

Uses

This grade is suitable for sash, door and trim factories and pattern lumber where short sections are required and for general cutting up purposes.

Value

In inch about $20 per M., and in thicker about $12 per M. less than No. 1 Cuts.

No. 3 CUTS

The next lower grade of cutting up lumber, containing 35 per cent. to 50 per cent. clear cutting in short sections. A slight amount of stain admitted.

Uses

Suitable for the manufacture of sash and blinds or any purpose where short sections of clear lumber are used.

Value

In inch about $6 per M. less, and in 5-4 and thicker about $15 per M. less than No. 2 Cuts.

No. 1 MOULDINGS

4 in. to 7 in. wide, 10 to 16 ft. long, practically free from defects on one face except bright sap, admitting of a slight amount of stain or other defect on back which does not interfere with the use of the board for one face purposes.

Uses

This is particularly suitable for making good Mouldings or clear face Trim or for any purpose where clear face lumber is wanted.

Value

About $10 per M. less than Fine Common.

No. 2 MOULDINGS

This grade is the reject from No. 1 Mouldings and admits of slightly more defect and stain on face. Same widths and lengths.

Uses

Suitable for a cheaper grade of Moulding and Trim. Very desirable for finishing lumber where narrow widths are wanted, admitting of slight defects to be used without waste in cutting.

Value

About $10 per M. less than No. 1 Mouldings.

STAINED SAPS

4 in. and wider, 10 to 16 ft. long, No. 1 Cuts and better, largely Fine Common and better for knot, admitting of any amount of stained sap, but practically free from shake and other defect.

Uses

Very suitable for any outside or inside finish or low price grade of mouldings and trim where the work is to be painted.

Value

About $5 per M. less than No. 2 Mouldings.

STAR CLEAR

4 in. and wider, 10 to 16 ft. long, the rejects of Fine Common and better on account of slight shake. No. 1 Cuts and better, largely Fine Common and better for knot, admitting of shake, but practically free from other defect.

Uses

Very suitable for inside trim and any purpose where clear lumber is desired and slight shake defect is not objectionable.

Value

About $2 to $5 per M. less than No. 2 Mouldings.

No. 1 SHELVING AND DRESSING

This is a high grade of finishing lumber and admits of small, sound knots, is prac-

tically free of other defects. Knots not usually larger than a twenty-five cent piece, and varying slightly in size and number according to the width and thickness of the piece.

Uses

Very desirable for inside and outside finishing lumber where small sound knots are not objectionable. Also suitable for pattern lumber for large work and a small, sound knotted grade can be used.

Value

In inch about $10 and in 5-4 and thicker about $6 per M. less than No. 2 Mouldings.

No. 2 DRESSING

This grade is put up No. 1 Barn and better for knot, admitting slight shake or stain defect. The majority of the knots are the same as contained in No. 1 Shelving and Dressing.

Uses

It is particularly suitable for mill purposes and for inside and outside work where a slightly lower grade of lumber is wanted than No. 1 Shelving and Dressing.

Value

About $4 to $6 per M. less than No. 1 Shelving and Dressing.

No. 1 SHELVING

This grade is put up 1x10 in. and wider stock widths, the same grade as No. 1 Shelving and Dressing with the exception that the same must show two good edges.

Uses

This grade is intended for high-class Shelving, exterior finish and for other purposes requiring a high-class stock pine board.

Value

About $5 more than No. 1 Shelving and Dressing.

No. 2 SHELVING

No. 1 Barn and better for knot, showing one good edge, but practically free from other defects.

Uses

Used for the same purposes as No. 1 Shelving, where only one good edge shows, or a slightly lower grade is wanted.

Value

About $5 per M. less than No. 1 Shelving.

No. 1 BARN

May contain any reasonable number of small, sound knots, usually red, largely round, but admitting of an occasional branch knot of small size, free from shake or stain, the size of the knot varying in accordance with the width of the board. The 5-4 and thicker admitting of slightly larger sound knots than inch boards.

Uses

Very suitable for outside finish, stepping, flooring, cornice, novelty siding and any exterior purpose requiring a lasting, sound and desirable wood.

Value

About $3 to $6 per M. less than No. 1 Shelving and Dressing, according to the thickness required.

No. 2 BARN

Admits of larger sized knots than No. 1 Barn, practically all red knotted, free from shake or stain and free from any knots that will impair the strength of the board.

Uses

Suitable where slightly larger knots can be used. Very desirable for barn siding, novelty siding, flooring, shelving, fencing, etc.

Value

About $3 to $6 per M. less than No. 1 Barn, according to the thickness.

No. 3 BARN

Admits of coarse, sound knots, free from knots that will knock out in dressing, practically free from shake, admitting of stain where the board is otherwise No. 2 Barn and better for knot.

Uses

Suitable for barn siding, cheap novelty siding, fencing, cellar partitions, or any outside work where a coarse, sound board of long lasting qualities is desired.

Value

About $5 to $7 per M., according to the width and thickness, less than No. 2 Barn.

No. 1 BOX

This grade admits coarse knots, regardless of size, also a reasonable amount of shake or stain. The Tonawanda grade of No. 1 Box is a good practical board for coarse work, including the manufacture of high-grade boxes, shelving, flask purposes and cheap flooring, also very desirable for sheathing, and sub-floors for high-grade houses where lasting qualities are desired.

Value

About $3 to $5 per M. less than No. 3 Barn.

The Tonawanda market, for the convenience of its customers, carries the following kinds of lumber, which can be furnished in mixed cars with White Pine:

MAPLE FLOORING
OAK FLOORING
FIR FLOORING
RED CEDAR BEVEL FLOORING
SPRUCE BEVEL SIDING
RED WOOD BEVEL SIDING
WHITE SPRUCE
HEMLOCK
NORWAY PINE
FIR STEPPING
RED CEDAR SHINGLES
BALED SHAVINGS
STAINED SHINGLES
SPRUCE SHINGLE LATH
CYPRESS
BOX SHOOKS

WHITE PINE

BEVEL SIDING
ALL GRADES

MOULDINGS
ANY PATTERN

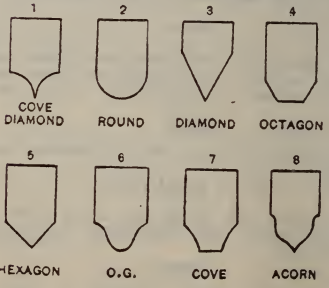
LATTICE

PICKETS

BOX SHOOKS

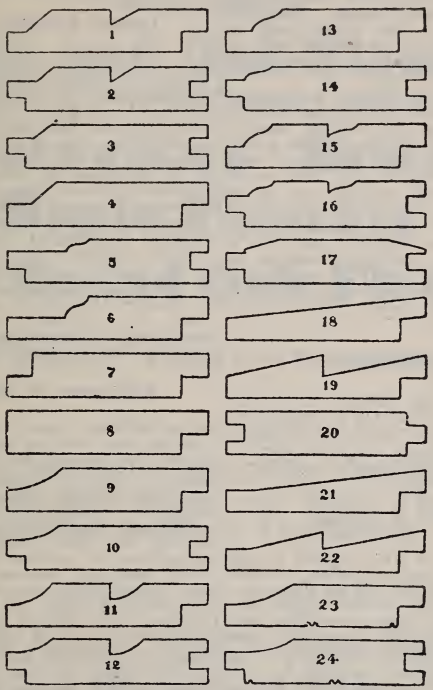
DIMENSION SHINGLES
SQUARE BUTT OR FANCY
AS PER PATTERN

FANCY BUTT PATTERNS



THE TONAWANDA MARKETS

Standard Patterns for Novelty and Cove Siding



Unless otherwise called for, rabbet will be made 5/8-inch
Please order by number

GRADING RULES FOR MAPLE, BEECH AND BIRCH FLOORING.

Adopted November 14, 1912, and published by

Maple Flooring Manufacturers' Association, 807 Stock Exchange Building, Chicago, Ill.

Clear.—13/16 inch and thicker, shall have one face free of all defects, but the question of color shall not be considered. Standard lengths in all widths in this grade shall be trimmed 2 to 16 feet; the proportion of lengths 2 to 3½ feet shall be what the stock will produce up to 15 per cent.

No. 1.—13/16 inch and thicker, will admit of tight, sound knots and slight imperfections in dressing, but must lay without waste. Standard lengths in all widths in this grade shall be trimmed 1½ to 16 feet; the proportion of lengths 1½ to 3½ feet shall be what the stock will produce up to 30 per cent.

Factory.—13/16 inch and thicker, must be of such character as will lay and give a good serviceable floor. Standard lengths in all widths in this grade shall be trimmed 1 to 16 feet; the proportion of lengths 1 to 3½ feet shall be what the stock will produce up to 50 per cent.

Standard Measurement.

Flooring ⅝ inch and thicker, all faces, is measured ¾ inch waste for matching.

Flooring ½ inch and thinner, all faces, is measured ½ inch waste for matching.

Jointed flooring, all thicknesses and faces, is measured ½ inch waste.

Characteristics of Grades.

While the grades are well defined in the Grading Rules, the characteristics of each grade are more fully described as follows:

Clear has one face free of all defects that will impair its general appearance and durability, but the question of color and mild discoloration is not considered, and an occasional slight discoloration caused by the cross-piece used in piling the rough lumber during the process of air-seasoning is not classified as a defect.

White Clear is special stock manufactured from White Clear Maple lumber from the outside of the log, winter-sawed and end-piled in sheds to prevent staining, is almost ivory white, and is the finest grade of Maple flooring it is possible to produce.

Red Clear Beech and Red Clear Birch are manufactured from all-red face stock, especially selected for color and are free from all defects. The color is a rich warm tint peculiar to no other wood.

No. 1 admits of tight sound knots and slight imperfections in dressing and the more prominent discolorations not admitted in the grade of Clear, and lays without waste.

Factory is of such a character as will lay and give a good serviceable floor for factory, warehouse and kindred uses.

Custom Governing Re-Inspection.

In the manufacture and grading of Maple, Beech and Birch flooring, the highest type of machinery and workmen are employed, but years of experience have shown that the most efficient inspectors will occasionally let some pieces slip into the wrong grade. Consequently if a re-inspection does not result in a difference in favor of the party complaining of more than 2 per cent. in money value from the original inspection, the party demanding the re-inspection shall accept the flooring as originally graded and pay all expenses connected with the re-inspection.

The quality of the flooring in the condition in which it leaves the manufacturer is held to govern the grade, as subsequent lack of care or improper treatment in laying, scraping or finishing are not chargeable to the manufacturer.

Advantages of Standard Lengths.

It will be found more advantageous to specify and use the Standard run of lengths in the different grades instead of special long lengths because lengths selected 4 feet or 6 feet and longer are much more expensive without compensating benefits.

Modern perfected methods of manufacturing hardwood flooring produce a larger proportion of shorter lengths than the old-time methods, because the defects are cut out closer, thus improving the average quality of the flooring, and experience has demonstrated that shorter lengths combined with longer lengths cost no more to lay and make as good or better floor at a material saving in cost than all long lengths. The shorter lengths can also be used to advantage in closets and other small spaces.

The stand of Maple, Beech and Birch stumpage is limited and is becoming rapidly depleted, and the sentiment in favor of conservation of forest resources is strongly in favor of the utilization to the greatest extent of these valuable woods, especially when the result attained in the finished floor is in nowise depreciated.

Strable Lumber & Salt Co.

Successors to

STRABLE MANUFACTURING CO.

Manufacturers of

Maple and Oak Flooring

5/4 or 1 1/6 Maple Flooring a Specialty

Wolverine Brand Maple Flooring

Tofco Brand Oak Flooring

WORTH REMEMBERING

We can ship:

13/16 x 2 and 2¼" face Plain Oak Flooring in mixed cars with Maple and Birch Flooring and Our Northern Hardwoods

EASTERN SALES OFFICE

101 Park Ave., (Architects' Building) New York City

Telephones, 2800-2801-2802 Murray Hill

R. A. BROWN, Manager

Main Office and Mills: SAGINAW, MICH.

OAK FLOORING

Grading Rules

Quarter-Sawed

Clear—Shall have one face practically free of defects, except ⅜ of an inch of bright sap; the question of color shall not be considered; lengths in this grade to be 2 feet and up, not to exceed 15 per cent. under 4 feet.

Sap Clear—Shall have one face practically free of defects, but will admit unlimited bright sap. The question of color shall not be considered. Lengths in this grade to be 1 foot and up.

Select—May contain bright sap, and will admit pin-worm holes, slight imperfections in dressing, or a small tight knot, not to exceed 1 to every 3 feet in length; lengths to be 1 foot and up.

Plain Sawed

Clear—Shall have one face practically free from defects, except ⅜ of an inch of bright sap; the question of color shall not be considered; lengths in this grade to be 2 feet and up, not to exceed 15 per cent. under 4 feet.

Select—May contain bright sap, and will admit pin-worm holes, slight imperfections in dressing, or a small tight knot, not to exceed 1 to every 3 feet in length; lengths to be 1 foot and up.

No. 1 Common—Shall be of such nature as will make and lay a sound floor without cutting. Lengths 1 foot and up.

Factory—May contain every character of defects, but will lay a serviceable floor with some cutting. Lengths 1 foot and up.

In ordering Oak Flooring, be sure and state whether Plain or Quarter-Sawed Red or White is desired.

The Use of Different Grades

Clear, Quarter-Sawed, Red or White—High class residences, hotels, apartment houses and club houses.

Sap Clear, Select, Quartered, Red or White—An economical substitute for Clear Quartered where a dark finish is desired. These grades make a flooring equally durable as the first grade.

Clear, Plain Sawed, Red or White—High class residences, hotels, apartment houses, churches and club houses.

Select, Plain Sawed, Red or White—Medium priced residences, hotels and apartments; schools, office buildings and stores.

No. 1 Common—Cheap dwellings, tenements, stores, high-class factories and manufacturers' buildings.

Factory—Warehouses, factories and cheap tenements.

Standard Thicknesses and Widths

13/16" Thickness; Widths 1½" face, 2" face and 2¼" face.

⅜" Thickness; Widths 1½" face and 2" face.

Widths

The 1½" face makes a better, more serviceable and handsomer floor than any other width. The shading of the figure of the wood may be blended more harmoniously than when the wider strips are used. The laying waste in the 13/16"x1½" face is less than 2" face, as it is counted ½" for the tongue and groove, whereas in the broader widths it is counted ¾". The cost per thousand feet is less than in the wider widths, which offsets additional cost for labor in laying.

The 2" and 2¼" faces are the widths more generally used in 13/16" thickness, and ⅜" thickness, either 1½" or 2" face, as conditions demand it.

How to Arrive at the Amount of Oak Flooring Required

To cover a certain space, figure the number of square feet, which means the width multiplied by the length; for instance, a room 12 feet wide by 15 feet long would contain twelve times fifteen or 180 square feet. Add to the square feet of surface to be covered the following percentages:

33⅓% for .....13/16"x1½"
37½% for .....13/16"x2"
33⅓% for .....13/16"x2¼"
33⅓% for .....⅜"x1½"
25% for .....⅜"x2"

The above figures are based on laying flooring straight across the room. Where there are bay windows, hearths and other projections, allowance should be made for excessive cutting.

Standard Weights of Oak Flooring

13/16"x2¼" face.....2200 lbs. per 1000 feet
13/16"x2" face.....2100 lbs. per 1000 feet
13/16"x1½" face.....2000 lbs. per 1000 feet
⅜"x2" face.....1200 lbs. per 1000 feet
⅜"x1½" face.....1000 lbs. per 1000 feet

In ordering Oak Flooring, be sure and state whether Plain or Quarter-Sawed, Red or White is desired.

Handling Oak Flooring

Oak Flooring is very often damaged after it leaves the factory by rough treatment. Handlers of Oak Flooring often treat it as ordinary lumber. This is a mistake, and often results in serious damage to the flooring.

Oak Flooring leaves the factory in perfect condition. The lumber has been air-dried, kiln-dried, cooled and milled accurately. Before shipping, it is stored in dry, well ventilated warehouses. Oak Flooring is shipped in box cars and should therefore reach the dealer in good condition. It should not be unloaded in rainy weather, and if the atmosphere is damp, the wagon should be covered with tarpaulin. It should never be piled in open sheds, even though protected by a roof, as any wood absorbs moisture from the air at the exposed ends. Stock then swells, impairing the accuracy of the mill work, and flooring thus carelessly handled often shrinks after having been laid, leaving unsightly cracks.

Oak Flooring should never be laid in a new building while the walls and plaster are damp; it should be the last work done in the building. It is most important that the brick or stone work, concrete and fireproof filling be thoroughly dry before the flooring is laid. To secure the best results, the better plan is not to lay the Oak Flooring until the painting, wall papering and decorating have been done and are thoroughly dry.

Laying Oak Floors

The laying of Oak Flooring is not very difficult. Any first-class carpenter can make a good job. Some judgment and care is very necessary in order to produce the best results.

A sub-floor should be used under both the 13/16" and ⅜" thicknesses. The sub-floor should be reasonably dry and laid diagonally. Boards of about 6" wide are preferred. These boards should not be put down too tight and should be thoroughly dried off and cleaned before the Oak Flooring is laid.

It is well to use a damp proof paper between the Oak Flooring and the sub-floor. Where sound proof results are desired, a heavy deadening felt is recommended.

Oak Flooring should be laid at an angle to the sub-floor. After laying and nailing three or four pieces, use a short piece of Hardwood 2x4 placed against the tongue, and drive it up.

The nailing of Oak Flooring is very important. All tongued and grooved Oak Flooring should be blind nailed. The best floor made can be spoiled by the use of improper nails. The steel cut variety is recommended for all blind nailing.

For 13/16" use 8 penny steel cut flooring nail.

For ⅜" use 3 penny wire finishing nail.

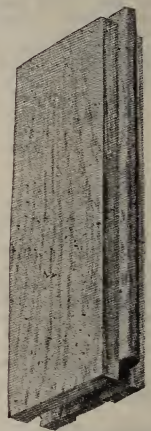
The maximum distance between the nails should be:

For 13/16" thickness.....16"

For ⅜" thickness.....10"

For even better results, it is recommended that the nails be driven closer than indicated.

Quarter-Sawed Tongued and Grooved, End-Matched Oak Flooring.



Plain-Sawed Tongued and Grooved, End-Matched Oak Flooring.

In ordering Oak Flooring be sure and state whether Plain or Quarter-Sawed Red or White is desired.

Scraping Oak Floors

After the Oak Flooring is laid and thoroughly swept, it is better to scrape it, in order to get the best results for a nicely polished surface. This scraping process can be done by the ordinary scrapers, such as used by cabinet makers, or by one of the many types of power or hand scraping machines that are generally used by contractors and carpenters. Always scrape lengthwise of the wood and not across the grain. A floor properly scraped looks very smooth,

but it should be thoroughly gone over with No. 1½ sandpaper to obtain the best results in finishing. After this, the floor should be swept clean, and the dust removed with a soft cloth. The floor is now ready for the finish.

FINISHING OAK FLOORS

The finishing of an Oak Floor is a very important feature, upon which authorities fail to agree, but the question resolves into a matter of cost, as to the color or brilliancy of finish desired. Personal taste, artistic or decorative effects are the guide for the floor finisher.

The "Clear" grade of Oak Flooring should have a natural Oak filler—color of Oak. For "Select" and "Sap Clear" grades a light golden oak filler should be used, and after the floor is filled, it should be gone over with a little burnt umber mixed with turpentine to darken light streaks. This will make the "Select" and "Sap Clear" grades look like the "Clear" grade, except that it will be slightly darker in color. In filling the "No. 1 Common" grade, a dark golden oak filler should be employed, and the light streaks should be darkened in the same manner as the "Select" and "Sap Clear" grades. If a little care is used in laying this grade, splendid results can be obtained.

First—Treat the floor with a paste filler of desired tone to fill up the pores and crevices. To thin the filler for application, one has a choice of using turpentine, benzine, wood alcohol or gasoline to get the right consistency. When the gloss has left the filler, rub off with excelsior or cloth, rubbing against the grain of the wood. This will make a perfectly smooth and level surface. It keeps out dirt and forms a good foundation, which is the key note for successful treatment of floors. Allow the filler twelve hours to set or dry before applying a wax or varnish finish. Never use a liquid filler on any floor.

A wax or varnish finish can be used. The wax finish is preferred by many, due to economy and ease of renewing places that show the wear. The renewing can be easily applied by housekeeper or servant.

Wax Finish—The best method for applying the wax is to take cheesecloth and double it to get a little more thickness; then make it into a sort of bag. Put a handful of wax inside of this and go over the floor thoroughly. You will find that you can work the wax through the meshes of the cheesecloth to give an even coating over the floor. This prevents too much wax in spots and wasting it. After the floor has been gone over with the wax and allowed to dry, say about twenty minutes, it is ready for polishing. Rub to a polish with a weighted floor brush, first across the grain of the wood, then with it. (A clean, soft cloth can be used in place of the brush if desired); then a piece of woolen felt or carpet should be placed under the brush to give the finishing gloss. After waiting an hour, a second coat of wax should be applied in the same way as the first and rubbed to a polish.

Varnish Finish—This is usually more expensive than the wax finish, but it gives a very hard surface, yet at the same time it is elastic. Two or three coats should be applied after the application of the paste filler. Each coat should be thoroughly rubbed with oil and pumice. Any of the standard Hardwood Flooring Varnishes are recommended.

Floor Oil Finish—When a high class finish is not desired, a very economical finish can be had by the use of a light flooring oil that is made expressly for this purpose by many paint and varnish houses and oil makers; it serves as a filler as well as a finish and is strongly recommended for Oak Flooring in public institutions, office buildings and stores. This oil keeps the dust from rising and preserves the floor.

Care of Oak Floors

If one only knows how, nothing is easier than the care of a well finished Oak Floor. Water should never be used on a waxed or varnished floor. The surface may safely be wiped with a cloth dampened in tepid water to remove dirt and dust, but the dampness should be immediately taken up with a dry cloth.

One of the best mixtures for keeping a floor in good condition is the use of equal parts of sweet oil, turpentine and vinegar well mixed, and rubbed on the floor with waste or a cotton or woolen rag. The vinegar will cut the dirt or grime worked into the finish from shoes; the sweet oil produces a lustre and the turpentine promptly dries the moisture.

The above mixture need not be applied oftener than once a month to insure a floor finish that will resemble the sheen of a piano.

Should wax finish become worn in spots from hard usage, a little of this mixture thoroughly rubbed will renew the finish quickly.

The occasional use of a weighted floor brush, alone or with a piece of Brussels carpet placed beneath it, will assist in keeping the finish of an Oak Floor in good condition.

Once a year it is well to use a good floor wax and rub it into the floor with the aid

of a brush, with or without a piece of carpet attached. Before the finish is worn down to the wood, an additional coat of wax should be applied and thoroughly rubbed.

Economical Use of Oak Flooring

As rugs are used almost universally in homes and offices, an economical plan is to have the center section of the room laid with Oak Flooring of a cheaper grade and to employ the better grades in the border. After the rug is laid, all parts of the floor will have the same appearance. A room, say 10'x12', can have a two-foot border of Clear (first quality), either Plain or Quartered, and in the center section, 6'x8', Select Plain could be employed. A center section of this size, 15 per cent. of the cost could be saved by using Select Plain. By using a little care in finishing up the Select, this grade can be made to look very much like the Clear grade. This makes quite a saving and is being done very extensively.

⅜" thickness by 1½" or 2" faces can be laid over old floors in old homes, or over cheap sub-floors in new homes very economically. It is cheaper than carpets or Pine flooring, and will improve the appearance and sanitation of an old or new house more than the expenditure of double the amount of money any other way.

Profitable Work for Carpenters

Carpenters and contractors find it very profitable during the slack periods, when outside work is dull, to solicit jobs in old homes, by the laying of ⅜" thickness by 1½" or 2" face over old Pine floors. Besides being profitable, the work is very agreeable. Artistic designs can be made very easily with Oak Flooring strips that require but very little more time to lay; besides it makes a vast difference in the appearance of the room. The winter season is the best time for laying ⅜" stock over old floors, because the wood is thoroughly dry and in good condition to receive it. It is very important that the old floor be level before laying the Oak Flooring. An old house laid with this thin Oak Flooring will enhance the renting and selling values fully 25 per cent.

NORTHWESTERN CEDARMEN'S ASSOCIATION

Standard Specifications of White Cedar

Standard Specifications of White Cedar Posts

Length of 7 foot posts may be 6 feet 10 inches; length of 8 foot posts may be 7 feet 10 inches; cut from live timber and peeled. Size of posts at top end may be one-fourth inch less than diameter specified. Pipe rot is allowed, and other rot defects which do not impair the strength of the post for the uses of a fence post. Four inches sweep one way is admissible. Discoloration or evidence of age, no defect, providing stock is reasonably sound and cut from live timber. Green, fresh or water-soaked posts must be plump measure for diameter specified.

Large Posts and Small Poles

Sizes, 4 inch 10 feet to 4 inch 25 feet, inclusive. Size at top end may be one-fourth inch less than diameter specified. Lengths may be two inches scant. On posts and poles 10, 12, 14, 16 and 18 feet long, 4 inch crook one way allowed; 20 and 25 feet, 5 inch crook allowed. Pipe holes in tops allowed. Must be cut from live timber and in other respects conform to post specifications. Green, fresh cut or water-soaked stock must be plump measure for diameter specified. Measurements for sweep on 18 foot, 20 foot and 4 inch 25 foot poles shall be taken as specified for standard telegraph, telephone and electric poles except that measurement shall be made from a point four feet from the butt instead of six feet as specified for the larger poles.

Standard Telegraph, Telephone and Electric Poles

Sizes, 5 inch 25 foot and upwards. Above poles must be cut from live growing timber, peeled and reasonably well proportioned for their length. Tops must be reasonably sound, and when seasoned must measure as follows: 5 inch poles, 15 inches circumference at top end; 6 inch poles, 18½ inches in circumference at top end; 7 inch poles, 22 inches circumference at top end. If poles are green, fresh cut or water-soaked, then 5 inch poles must be 5 inches plump in diameter at top end, 6 inch poles must be 19½ inches in circumference, and 7 inch poles 22¾ inches in circumference at top end. One way sweep allowed not exceeding one inch for every five feet, for example, in a 25 foot pole, sweep not to exceed five inches, and in a 40 foot pole eight inches; in longer lengths one inch additional sweep permissible for each additional five feet in length. Measurement for sweep shall be taken as follows: That part of the pole, when in the ground (six feet) not being taken into account in arriving at sweep, tightly stretch a tape line on the side of the pole where the sweep is the greatest, from a point six feet from butt to the upper surface at top, and having so done, measure widest point from tape to surface of pole, and if, for illustration, upon a 25 foot pole said widest point does not exceed five inches said pole comes within the meaning of these specifications. Butt rot in the center including small ring rot outside of the center; total rot must not exceed 10% of the area of the butt. Butt rot of a character which plainly seriously impairs the strength of the pole above ground is a defect. Wind twist is not a defect unless very unsightly and exaggerated. Rough large knots if sound and trimmed smooth are not a defect.

Specifications for Standard Ties

A standard tie shall be 6 inch face and wider, 12 inches from small end, 6 inches thick and 8 feet long sawed ends. Ties made different from these specifications shall be regarded as special contracts.

Shingle Specifications

Extra Star A Star Shingles shall be manufactured as follows: 10 inches clear and better from butt, with all clears in; nothing narrower than 3 inches in width allowed; 5 butts to measure 2 inches when sawed. All extra Star A Star Shingles to be 16 inches in length. Standard Star A Star Shingles shall be 5 to 10 inches clear from butt; nothing narrower than 2 inches allowed; 5 butts to measure 2 inches when sawed; 10% sap is allowed in this grade.

RULES FOR THE INSPECTION OF HEMLOCK LUMBER

As Revised at the Annual Meeting in Milwaukee, Wis., January 29, 1913.

The Northern Hemlock and Hardwood Manufacturers' Association
Wausau, Wis.

ESTIMATED WEIGHTS OF HEMLOCK LUMBER

Per M. Feet

Shipping Dry

3″ Plank Rough	3000
3″ Plank & 4x4 to 8x8, S1S1E	2700
3″ Plank, S4S or D&M	2500
4x10 to 12x12, Rough	3500
4x10 to 12x12, S1S1E	3200
4x4 to 8x8, Rough	3000
Thick D & Better, S1S	2500
Thick D & Better, S1S1E	2200
2″ Piece Stuff, S1S1E	2200
2″ Piece Stuff, Rough or S1E	2500
2″ Piece Stuff, S4S or D&M	2000
1″ Boards, Rough	2400
1″ Boards, S1S or S2S	2000
1″ Clear & Select, S1S	2000
Shiplap, D&M or Drop Siding	1800
1x6 Well Tubing, Beveled Edges	1800
Sheathing Lath	1500
Lath	500
32″ Lath	300

HEMLOCK

GENERAL INSTRUCTIONS

The principal objects to be sought in the formulation of these rules are to establish grades that will blend the slight characteristics incident to different localities in such a manner as to produce grades of equal quality and value and so constructed as to be best adapted to the principal purposes for which hemlock lumber can be utilized.

1. The face side of the lumber is the side showing the best quality or appearance.

2. Defects in lumber should be distributed in proportion to the size of the piece. Long or wide pieces of the same grade may contain more and greater defects than shorter or narrower pieces. The same percentage should be observed in both long and short, wide and narrow.

3. Wane in lumber is a defect which cannot be described by rule with satisfaction, and therefore must be left to the judgment of the grader. The lowering of grade on the face side on account of wane should be governed by grade, width and defects in the piece.

4. Lumber must be accepted on grade in the form in which it was shipped. Any subsequent change in manufacture or mill work will prohibit an inspection for the adjustment of all claims, except with the consent of all parties interested.

5. Mixed width boards do not necessarily require as good edges as shiplap or dressed and matched stock of the same grade.

6. Planing mill work should be taken into consideration in all grades of dressed lumber and its effect on a piece must be left largely to the judgment of the inspector.

7. The grade of partition shall be determined from its poorer side only, when the order specifies partition.

8. Lumber when worked shall be graded the same as the respective grades when in the rough.

9. Unless otherwise provided for, lumber worked two sides shall be graded from its better face; lumber worked one side shall be graded from its surfaced face.

10. The examples given in this book do not in all cases include all of the different types in any grade.

WATER STAIN

11. In hemlock will often be found streaks or patches of red or brown discoloration, sound and firm, the presence of which does not weaken the wood, nor detract seriously from its utility. Water stain should not be confused with rot, being firm and strong, while rot is soft and decayed wood.

THICK D AND BETTER

1. Thick and Better shall be four inches wide and wider, one and one-fourth inch, one and one-half inch and dimension thickness.

2. This grade shall have sound, square edges, and be of the grade of Inch D Stock and Better on the face side, and not below the grade of Inch No. 1 Common on the back of the piece.

EXAMPLES

Example 1—Piece 2x4-14, S2S. Has one black three-fourths inch knot four feet from end, two one-half inch black knots near center. All knots sound and firmly set. No other defects.

Example 2—Piece 2x4-10, S2S&E. Has one one-inch red knot twelve inches from

cent two one-half inch red knots within
from inches of each other and four feet
knot nd; one three-fourths inch red knot
knot t from other end. All knots sound
inch nly set. No other defects.
well ple 3—Piece 2x6-16, S4S. Has twelve
edges firmly set red knots from one-eighth
F inch in diameter, scattered over face
ece. No other defects; good edges.
Ha ample 4—Piece 2x8-14. Has three red,
nea knots from one end and one-half to
eig inches long one three feet from one
kn one four feet from the other end, and
sm ther six feet from same end. There
E ny number of small pin knots scattered
Ha the face. All knots red, sound and
all set. No other defects. Good edges.
fa ample 5—Piece 2x8-16, S2S. Has three
the nd one-fourth inch red knots, located
bro ctively, three feet from one end, one
any eet from same end and one near cen-
Ex Seven one-inch to one-half inch red
s three-cattered over face. All knots sound
u knots nly set. No other defects.
all ple 6—Piece 2x10-14. Has two one
face ree-fourths inch red knots within
for inches of each other six feet from
oth end and near center crosswise. Three
knots from five-eights to one inch in
diameter scattered over the remainder of the piece. One one-half inch black knot two feet from end. All knots sound and firmly set. No other defects; edges good.

Example 7—Piece 2x10-16, S4S. Has three red, sound, firmly set knots from one-half to one inch in diameter within four feet of one end, and fifteen sound, firmly set, black pin knots scattered over the remainder of the piece. No other defects; good edges.

BOARDS AND STRIPS

There are six grades made in Boards and Strips:

Inch Clear and Select.
Inch D Stock.
No. 1 Common.
No. 2 Common.
No. 3 Common.
No. 4 Common.

INCH CLEAR AND SELECT

1. **Inch Clear and Select** should be four inches and wider, and eight feet long and longer, not to exceed 10 per cent. eight feet long.

2. This grade is especially adapted for interior finish and only the face, or best side is expected to show, although some attention should be given to the back of the piece.

3. The face shall show no wane, but the back may show such an amount of wane or other defects as will not interfere with the use of the piece for finishing purposes.

4. No shake or season check shall be allowed on the face side, but a very little tight shake and checks that are not deep may appear on the back of the piece.

5. This grade will admit on the face side of several tight pin knots not over three-eights of an inch in diameter. In a four or six-inch twelve feet and longer piece, not more than three knots are admissible, and proportionately more in a wider piece.

6. A ten or twelve-inch piece twelve feet and longer will not admit of more than three sound, firmly set knots, not to exceed three-fourths of an inch in diameter. Narrower and shorter pieces will admit of fewer large knots, but not a combination of large knots and other defects.

7. Pieces twelve feet and longer are admissible that will, with not more than 10 per cent. of waste, produce two clear cuts, each four feet long or longer.

EXAMPLES

Example 1—Piece 1x4-14, S2S. Has one five-eighths inch, red, sound, firmly set knot six feet from end, and two three-eighths inch, sound, black, firmly set knots; one two feet from one end and the other three feet from the other end. No other defects. Piece has a smooth appearance.

Example 2—Piece 1x6-16, S2S. Has one three-fourths inch red knot four feet from end; one three-eighths inch black knot two feet from end, and one one-half inch black knot three feet from the other end. All knots sound and firmly set. No other defects.

Example 3—Piece 1x6-10, D&M. Has one three-eighths inch, black, firmly set knot three feet from end, and one knot of same description two feet from other end. No other defects.

Example 4—Piece 1x8-14. Has one checked and broken three-inch knot five feet from one end. No other defects. This is a cutting piece.

Example 5—Piece 1x10-16, S2S. Has two red three-quarter inch knots, one two feet and the other five feet from one end. One five-eighths inch black knot three feet from other end, and two three-eighths inch black knots two and four feet, respectively, from the same end. All knots sound and firmly set. Piece has clear edges and good, smooth appearance. No other defects.

Example 6—Piece 1x12-12, S2S. Has three small, firmly set, black knots scattered over two-thirds the length of the board and near the center crosswise. On one end of the back is three inches of wane running to a feather-edge on extreme end, but gradually

receding and running out three feet from the end from which it starts. No other defects.

Example 7—Piece 1x12-14, S2S. Has one three-fourths inch and two three-eighths inch, firmly set, black knots scattered over three feet of the face of the piece near center; one one-half inch red knot ten inches from end. No other defects.

Example 8—Piece 1x12-16, S2S. Has three three-fourths inch red and two three-fourths inch black knots, all sound and firmly set, well scattered lengthwise, and within five inches of the center of the piece crosswise. No other defects.

Example 9—Piece 1x6-14, S2S. Has one three-eighths inch black knot three feet from end, and one one-half inch black knot four feet from the other end. Both knots sound and firmly set. Otherwise perfect face. On the back, six feet from the end, near the center of the piece crosswise, is very slight, fine shake covering about two by six inches. This shake does not go through the face of the piece.

Example 10—Piece 1x8-16. Has three one-half inch sound, firmly set, black knots scattered over seven feet of the piece. Otherwise perfect face. On the back, commencing five feet from the end and extending along for three feet, are seven checks from two to four inches long, running diagonally. These checks do not extend through or seriously weaken the piece.

INCH D STOCK

1. **Inch D Stock** shall consist of Boards and Strips below the grade of Clear and Select, four inches and wider, and eight feet long and longer, not to exceed ten per cent. eight feet long, and must be of a sound and water-tight character.

2. All knots must be sound and firmly set. Red knots must not exceed one and one-fourth of an inch in diameter, and spike knots must not exceed in length one-fourth the width of the piece. Black knots must not exceed three-fourths of an inch in diameter, and must be especially well set.

3. A six-inch strip twelve feet long shall not contain more than three defects of the extreme sizes. A wider or longer piece may contain relatively more of these defects, and narrower and shorter pieces relatively less. The general appearance of the piece must be taken into consideration.

4. No shake shall be allowed in this grade, but slight season checks and water stain shall not be considered defects.

5. This grade shall be suitable for sound Drop Siding, Ceiling and Flooring, and shall have a smooth appearance, especially on the edges.

EXAMPLES

Example 1—Piece 1x4-14, D&M. H one and one-fourth inch red knot and red and black knots from three-quar an inch to pin knots, all sound and set, scattered over the face of the No other defects.

Example 2—Piece 1x4-16, D&M. Has sound, firmly set, black knots from on of an inch to one-eighth of an inch in eter, well scattered over the face o piece. Eighteen inches of sound, hard, stain near center of piece. No othe fects.

Example 3—Piece 1x6-10. Has four s red, firmly set, spike knots four feet one end and within ten inches of each and four small, black, firmly set, pin well scattered. No other defects; edges.

Example 4—Piece 1x6-10, Drop Has nine red knots from one and one inches to one-fourth inch in diamete tered over face of piece. Edges go extra smooth-looking.

Example 5—Piece 1x6-10, S2S. H three-quarter inch black knot one foot end; one one-fourth inch black knot inches from end, and one one-fourth black knot four feet from same end. three knots sound and firmly set. S season checks on back running diagon but not deep enough to go through t face or materially weaken the piece. other defects.

Example 6—Piece 1x6-12, Drop Siding. Has three red knots scattered over one-half length of piece. On one end one and one-fourth inch red knot, and six red knots from one-half inch to one-eighth of an inch in diameter well scattered over face of piece. No other defects.

Example 7—Piece 1x6-12. Has one red sound, firmly set, spike knot running from edge one and one-half inches towards center of piece to a point. Fifteen sound, firmly set, black and red knots from one inch to one-eighth of an inch in diameter, well scattered. No other defects.

Example 8—Piece 1x6-16, D&M. Has three one-eighth to one-half inch black knots scattered over five feet on one end of piece. On other end there is wane on one side, on the back, running across the piece for three inches and nearly to face in depth, and extending three feet in length. On opposite edge, one inch of wane one-half inch deep and running out two feet from the end from which it starts. No other defects.

Example 9—Piece 1x8-12, Drop Siding. Has one red, sound, firmly set spike knot running from edge two inches toward the

center of the piece and located four feet from the end. One three-fourths inch black knot six inches from end, and seven black knots from one-half to three-eighths of an inch in diameter. All sound, firmly set and well scattered. No other defects. Face and edges smooth and well milled.

Example 10—Piece 1x8-12, Drop Siding. Has one one and one-fourth inch red knot near center and fourteen red knots from one-eighth to one-half inch, well scattered. All knots sound and firmly set. Good edges and smooth appearance.

Example 11—Piece 1x8-16, Drop Siding. Has five red knots and eight black knots, all sound, firmly set and well scattered over face of piece. For four feet on one end there is five inches of water stain of a brown color, but it is as hard and firm as any part of the piece. No other defects.

Example 12—Piece 1x10-10, S1S. Has five three-fourths inch and two one-half inch red knots and three one-fourth inch black knots, all sound, firmly set and well scattered over face of piece. Slight traces of water stain for three feet on half length of piece. No other defects; smooth face and edges.

Example 13—Piece 1x10-16, S1S. Has one three-fourths inch, two one-half inch, and five small pin knots, all black, sound, firmly set and well scattered over one-half the length of the piece. No other defects.

Example 14—Piece 1x12-12, S1S. Has one three-fourths inch knot eight inches from one end; one three-fourths inch knot two feet from same end; one one-half inch knot four feet from other end, and two one-half inch knots near center; all black, sound and firmly set. There are five season checks from four to six inches long for six feet on back, but they are narrow and do not go through to face.

Example 15—Piece 1x12-16. Contains six one and three-fourths inch red knots and fourteen red knots from one inch to one-half inch in diameter, all sound and firmly set, evenly scattered over the face of the piece. Edges smooth and face has smooth, tight appearance.

Example 16—Piece 1x12-16. Has fourteen sound, firmly set, red knots from one and one-fourth inches to pin knots well scattered over face. No other defects; edges smooth.

Example 17—Piece 1x12-16, S2S. Three inches from one end, ten inches from the other end, and in the center of the board, respectively, are three one and one-fourth inch red knots, well scattered lengthwise, and near the center of the piece crosswise are two one-inch and two three-fourths inch red knots. All knots sound and firmly set. No other defects.

INCH No. 1 COMMON

1. The Grade of No. 1 Common in boards or strips includes stock of a generally sound character.
2. Some shake is admissible.
3. Numerous knots, whether red or black.
4. Some water stain of a firm character.

EXAMPLES

Example 1—Piece 1x6-16, No. 1 D&M. Shows considerable shell shake for three feet at one end; at the other end machine has gouged out a piece one-half inch deep and two inches in diameter. There are also two one-half inch black knots near center.

Example 2—Piece 1x8-14, No. 1 S1S. Has four sound red knots averaging one and one-half inches in diameter; six sound red knots—under one inch in diameter, all well scattered; one unsound black knot one inch in diameter one foot from end, and three feet from same end one sound black knot one inch in diameter. With the exception of this end, the piece has a very sound, smooth appearance. No shake.

Example 3—Piece 1x8-12, No. 1 Shiplap. There are nine sound red knots, one and one-quarter inches and less in diameter, scattered over the face. Machine has gouged a hole three-quarters by one and one-half inches on one edge near end and a small amount of shake appears near end.

Example 4—Piece 1x8-12, No. 1 S1S. Has six black knots three-quarters to one inch in diameter and three three-eighths inch black knots, also two feet of shake at one end.

Example 5—Piece 1x8-12, No. 1 Shiplap. Shows a two and one-half inch sound red knot at one end, at center a one-inch knot. Directly opposite this knot the machine tore out on edge a piece one-half inch deep by two inches long, and within four feet from other end are three black knots, one being one inch in diameter and two three-quarters inch in diameter; also shows three short season checks.

Example 6—Piece 1x10-16, No. 1 Shiplap. Is peppered with red and black knots one and one-half inches and less in diameter over the entire face. One three-quarter inch knot is unsound; for eight feet along one edge has two inches of tight shake, and the opposite edge shows nearly as much. Piece very smooth in appearance.

Example 7—Piece 1x10-16, No. 1 S1S. A discoloration of water stain is shown over the face of this piece for four feet at one end and spots of stain over balance of face. Also local shake in two places. Piece has the general appearance of a select.

Example 8—Piece 1x10-16, No. 1. Shows heart shake for five feet along the center, four cross or horn knots one by three inches and three feet from end a thin spot one foot long that machine could not surface.

Example 9—Piece 1x10-16, No. 1 S1S. Has six black knots three-quarters inch and less in diameter. One sound red knot one and one-half inches in diameter, and a spot of hard rot two by eight inches that does not go through.

Example 10—Piece 1x12-16, No. 1 S1S. Shows shell and heart shake in spots the entire length, but shake does not extend through the board. Also several horn knots that are small and sound. General appearance good.

Example 11—Piece 1x12-16, No. 1 S1S. Shows numerous small red and black knots scattered over face. Also two one-inch sound black knots.

INCH No. 2 COMMON

1. Boards or strips will admit of considerable shake.
2. Black, unsound knots.
3. Two or three good-sized knot holes, or more of small ones.
4. Streaks or patches of discoloration, showing partial decay.
5. This grade can be safely recommended for general building purposes.

EXAMPLES

Example 1—Piece 1x6-16, No. 2 D&M. Has been badly torn by machine in four or five places; otherwise sound.

Example 2—Piece 1x6-12, No. 2 D&M. Has one-inch edge knot hole near one end, two three-fourths inch knot holes three feet from same end and a three-fourths inch loose knot twelve inches from hole, and at other end an inch loose black knot.

Example 3—Piece 1x8-16, No. 2 Shiplap. Within four feet of one end shows two one-half inch knot holes, also small piece broken out on edge by machine; at other end a three-fourths inch knot hole. Balance of piece a sound, knotty appearance.

Example 4—Piece 1x8-14, No. 2 Shiplap. Has shell shake for three feet at one end, two feet of shell shake at center, a one and one-half inch knot hole four feet from other end and two one-half inch black knots.

Example 5—Piece 1x8-16, No. 2 D&M. For three feet at one end is an extensive shell or cross shake, also an inch hole on edge torn by machine. At center a two-inch loose black knot; at the other end a one and one-fourth inch unsound knot.

Example 6—Piece 1x8-14, No. 2 Rough. Has three one-inch knot holes within eight feet; two black three-fourths inch knots at center and two feet of shake at end.

Example 7—Piece 1x10-12, No. 2 Shiplap. Has extensive shake half the width of piece the entire length. No other imperfection excepting a few sound red knots.

Example 8—Piece 1x10-16, No. 2 S1S. Shows extensive shake four feet near center; several coarse, sound knots, and stain over one-half of piece.

Example 9—Piece 1x10-14, No. 2 Rough. Has a two and one-half inch knot hole, two feet from end, and one and one-half inch black knot along side of it. At other end a two-inch unsound knot and a small amount of shell shake through center of board.

Example 10—Piece 1x12-16, No. 2 S1S. Has a straight split two feet long at one end, from which extend red streaks two inches wide by three feet long at center; a two-inch black unsound knot, with four feet of very tight shake at other end.

Example 11—Piece 1x12-14, No. 2 Rough. Within four feet from one end are eight black knots one inch and less in diameter. One one-inch knot hole; an open season check eighteen inches long. At other end shell shake for three feet and three three-fourths inch black knots.

Example 12—Piece 1x6-16, No. 2 D&M. Shows a half-inch knot hole three feet from end, also two half-inch edge knots sloughed off but not leaving holes. There are twelve other knots one inch and less in diameter, two having unsound centers. With these defects it still retains a good appearance.

INCH No. 3 COMMON

1. The defects may consist of excessive shake.
2. Very coarse, unsound knots.
3. Some soft rot.
4. Some cross checks.

EXAMPLES

Example 1—Piece 1x8-16, No. 3. Has three three-inch knot holes within six feet from end. Three large coarse knots and two black unsound knots.

Example 2—Piece 1x8-14, No. 3 Rough. Has three large rotten knots, two inches and over in diameter; one edge knot hole and three feet of soft rot on one face.

Example 3—Piece 1x8-14, No. 3 Rough. Is streaked with rotten sap. Is coarse knotted, badly checked and one-half inch of edge split off for three feet.

Example 4—Piece 1x10-16, No. 3. On one side shows extensive soft rot two-thirds its entire length and streaked with rot on other side.

Example 5—Piece 1x12-16, No. 3 Rough. Is much cross checked.

INCH No. 4 COMMON

4 Inches and Wider, 4 Feet and Longer

This grade includes all serviceable lumber below the grade of No. 3.

PIECE STUFF OR DIMENSION

No. 1 DIMENSION

1. The grade of No. 1 Dimension will admit of shake that will not materially affect the strength of the piece.
2. Also knots, either black or red, that are well located and fairly sound.
3. Or some slight cross checks or sound water stain.
4. This grade, while admitting the above defects, must at the same time retain the element of strength required for any building purposes.

EXAMPLES

Example 1—Piece 2x4-12, No. 1. Shows heart shake along one edge for half length, and one foot of same with two sound branch knots, three-fourths inch wide, on other edge.

Example 2—Piece 2x4-12, No. 1. Shows shake running along with grain for nearly its entire length; does not show on back and is therefore strong enough for building purposes.

Example 3—Piece 2x4-16, No. 1. With exception of extensive stain on one side and five very small round knots, the piece is perfect.

Example 4—Piece 2x4-16, No. 1. One side is perfect. On the other are six worm holes and it is checked, but does not affect the strength of piece.

Example 5—Piece 2x8-16, No. 1. Shows five one-inch black knots, and two one and one-half inch red knots, all running through the piece and well scattered. On one edge for four feet at one end is wane one-half inch by three-fourths inch deep.

Example 6—Piece 2x8-12, No. 1. Shows a streak of red stain half its length on one side only. Two sound red knots two inches in diameter, four feet apart, and one one and one-half inch knot sloughed off one edge.

Example 7—Piece 2x8-14, No. 1. Has one and one-half inch round knot hole across one edge one foot from end, also one two-inch and three one and one-quarter inch sound red knots well scattered. No other defects.

Example 8—Piece 2x8-16, No. 1. Shows heart shake and numerous small, sound, red knots for entire length of one side; otherwise perfect.

Example 9—Piece 2x12-12, No. 1. Shows shell shake four inches by three feet on one side, a straight split on one end one foot long, one three-quarter inch sound knot and two black knots one inch in diameter.

Example 10—Piece 2x12-14, No. 1. At four feet from one end has one and three-quarter inch knot hole on one edge, and on opposite edge three feet of tight shake; otherwise perfect.

Example 11—Piece 2x12-14, No. 1. Shows considerable tight shake for six inches over two-thirds its face; also one black horn knot one-half by three-quarters inch near center. Shake does not go through and piece has strength to carry it.

Example 12—Piece 2x12-16, No. 1. Has five black knots one and one-half inches in diameter and four one-half inch black knots. One of the largest knots unsound; also numerous checks six inches long, lengthwise of the piece. While it shows many defects, it is strong enough for any building purpose, but simply on appearance would be considered a line piece.

Example 13—Piece 2x12-16, No. 1. Has a select appearance and nearly perfect. Shows no defects except a short straight check at one end.

No. 2 DIMENSION

1. The grade of No. 2 Dimension includes stock not good enough to be classed as No. 1, and the defects admissible are of the same general character as the defects found in No. 1, except that they are more pronounced.
2. Considerable shake, large unsound knots, loose knots, knot holes and cross checks are all admissible in this grade, but not a serious combination of these defects in any one piece.

EXAMPLES

Example 1—Piece 2x4-16, No. 2. Shows four feet of rot on both sides, but not so extensive as to materially weaken the piece. Otherwise sound.

Example 2—Piece 2x4-16, No. 2. Shows rot on one side for two and one-half feet and a large, coarse branch knot that weakens it too much for No. 1.

Example 3—Piece 2x4-16, No. 2. Is a heart piece and shows shake along one edge nearly the entire length. At one end shake shatters it enough to weaken piece somewhat.

Example 4—Piece 2x4-16, No. 2. Shows wane across the piece three-quarters inch deep on one side for five feet.

Example 5—Piece 2x6-16, No. 2. Shows

some shake for two feet at one end and one-half dozen small, sound, red knots scattered over the face, and streak of firm, hard rot two to three inches wide, running for three feet in length. This rot shows through on both sides and one edge.

Example 6—Piece 2x8-12, No. 2. Has a two and one-half inch knot hole in center, four feet from end, and one face shows shell shake for four feet.

Example 7—Piece 2x8-12, No. 2. Has extensive shake five feet from one end and seven small, sound, black knots. If it were not for the character of the shake, which is crosswise of the piece, and weakens it, it would be considered a good No. 1.

Example 8—Piece 2x10-14, No. 2. Shows moderately tight shake for one-half its length and on one side, three feet from end, wane, three inches wide, three-quarters inch deep, extending for three feet. It is graded down strictly on account of appearance.

Example 9—Piece 2x10-14, No. 2. Has six sound black knots, well scattered; one is two inches in diameter, two are one and one-half inches in diameter and balance are less than one inch. While the knots are black, they are firm, well set and piece considered sound.

Example 10—Piece 2x8-14, No. 2. Shows a straight split for two feet at one end and at other end shake for three feet on two sides. Otherwise sound.

Example 11—Piece 2x12-16, No. 2. Shows shake over entire face for full length, very little of it going through; several small sound red knots.

MERCHANTABLE

The grade of Merchantable is a combination of No. 1 and No. 2, consisting of approximately 50 per cent. of each.

No. 3 DIMENSION

1. The defects are excessive shake, numerous knot holes, coarse, rotten knots, or considerable rot.

2. This grade can be recommended for cheap, light construction.

EXAMPLES

Example 1—Piece 2x6-16, No. 3. Has three two-inch rotten knots with holes part way through from face; on the back considerable soft rot for half the length of the piece.

Example 2—Piece 2x6-14, No. 3. Within four feet of one end has a knot hole so large as to leave only three inches of lumber. Is extremely shaky and otherwise weakened by defects.

Example 3—Piece 2x6-12. Has a combination of coarse knots, and open shake to such an extent as to weaken it for anything but temporary building purposes.

Example 4—Piece 2x8-16, No. 3. Contains soft rot on one side for six feet and is extremely shaky on one face.

Example 5—Piece 2x12-16, No. 3. Shows open shake for one-half its face for full length and balance of the piece shows extensive water stain.

Example 6—Piece 2x6-16, No. 3. Has ten coarse knots from one and one-half to two inches in diameter, well scattered. One knot hole one and one-half inches in diameter on edge and shows shell shake over two-thirds of face.

Example 7—Piece 2x12-16, No. 3. At one foot from end on one edge shows a hole one by three inches where knot is sloughed off one side. At center two knot holes one foot apart and one and one-half inches in diameter. There are also five small sound red knots and two feet of shake.

No. 4 DIMENSION

2x4 and Wider—4 Feet and Longer.

This grade includes all serviceable Dimension below the grade of No. 3.

HEMLOCK LATH

1. Owing to the rapidity with which Lath are manufactured and necessarily handled in grading, the misplacement of an occasional piece is practically unavoidable. For this reason a variation of ten per cent. or less off grade is provided for in our rules. This provision is intended to cover accidentally misplaced pieces only, and every reasonable effort should be made to have the grades conform to the specifications without regard to this percentage provided for misplaced pieces.

No. 1 LATH

1. No. 1 Hemlock Lath shall be butted to not less than thirty-one and three-fourths inches or forty-seven and three-fourths inches long, not more than one-eighth of an inch scant of one and one-half inch wide and not more than one-sixteenth of an inch scant of three-eighths of an inch thick, and of sound material.

2. Will admit wane one-third the thickness and one-third the width for one-third the length on one side the piece or its equivalent otherwise located when not in combination with other serious defects.

3. Any number of pin knots, three or

four half-inch knots well scattered, or more smaller knots, all well set, firm and sound that do not weaken the piece, are admissible in a four foot, and a proportionately less amount in a thirty-two inch No. 1 Lath.

4. Firm, fine shake extending over one-half the surface of the piece that does not materially impair its strength, is admissible when not in combination with other serious defects.

5. A few worm holes in an otherwise sound piece are admissible.

6. Stain shall not be considered a defect, although mould that has caused the surface of the piece to decay or scale off is a defect not admissible in this grade.

7. Ten per cent. or less of No. 2 Lath shall be allowed in this grade.

No. 2 LATH

1. Pieces of No. 1 quality with an average of not more than one-fourth of an inch scant in width and one-eighth of an inch scant in thickness are admissible in this grade.

2. No. 2 Lath may contain firm streaks and patches of rot; sound knots; an occasional loose knot or knot hole; dead wood, worm holes, wane, season checks, shake and pitch pockets, that by themselves or in combination with these or other defects do not seriously impair the usefulness of the piece.

3. Both ends of a No. 2 Lath should have at least an inch in width of firm wood for nailing.

4. Ten per cent. above or below this grade is admissible.

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Henry S. Graves, Forester

Forest Products Laboratory Series

STRENGTH VALUES FOR STRUCTURAL TIMBERS

By

McGARVEY CLINE,

Director, Forest Products Laboratory

RESULTS

Tables 1 and 2 give the average results obtained from tests on green material, while Tables 3 and 4 give average results from tests on air-seasoned material. The small specimens, which were invariably 2 by 2 inches in cross section, were free from defects, such as knots, checks, and cross grain; all other specimens were representative of material secured in the open market. The relation of stresses developed in different structural forms to those developed in the small clear specimens is shown for each factor in the column headed "Ratio to 2″ x 2″." Tests to determine the mechanical properties of different species are often confined to small clear specimens. The ratios included in the tables may be applied to such results in order to approximate the strength of the species in structural sizes, and containing the defects usually encountered, when tests on such forms are not available.

A comparison of the results of tests on seasoned material with those from tests on green material shows that, without exception, the strength of the 2 by 2 inch specimens is increased by lowering the moisture content, but that increase in strength of other sizes is much more erratic. Some specimens, in fact, show an apparent loss in strength, due to seasoning. If structural timbers are seasoned slowly, in order to avoid excessive checking, there should be an increase in their strength. In the light of these facts it is not safe to base working stresses on results secured from any but green material. For a discussion of factors of safety and safe-working stresses for structural timbers, the reader is referred to the report of the committee on wooden bridges and trestles of the Railway Engineering & Maintenance of Way Association published in the Association Bulletin 107.

TABLE 1.—*Bending tests on green material.*

Species.	Sizes.		Number of tests.	Per cent of moisture.	Rings per inch.	F. S. at E. L.		M. of R.		M. of E.		Calculated shear.	
	Cross section.	Span.				Average per square inch.	Ratio to 2" by 2".	Average per square inch.	Ratio to 2" by 2".	Average per square inch.	Ratio to 2" by 2"	Average per square inch.	Ratio to 2" by 2".
	Inches.	*Ins.*				*Lbs.*		*Lbs.*		*1,000 lbs.*		*Lbs.*	
Longleaf pine	12 by 12	138	4	28.6	9.7	4,099	0.83	6,710	0.74	1,523	0.99	261	0.86
	10 by 16	168	4	26.8	16.7	4,193	.85	6,453	.71	1,626	1.05	306	1.01
	8 by 16	156	7	28.4	14.6	3,147	.64	5,439	.60	1,368	.89	390	1.29
	6 by 16	132	1	40.3	21.8	4,120	.83	6,460	.71	1,190	.77	378	1.25
	6 by 10	180	1	31.0	6.2	3,580	.72	6,500	.72	1,412	.92	175	.58
	6 by 8	180	2	27.0	8.2	3,735	.75	5,745	.63	1,282	.83	121	.40
	2 by 2	30	15	33.9	14.1	4,950	1.00	9,070	1.00	1,540	1.00	303	1.00
Douglas fir	8 by 16	180	191	31.5	11.0	3,968	.76	5,983	.72	1,517	.95	269	.81
	5 by 8	180	84	30.1	10.8	3,693	.71	5,178	.63	1,533	.96	172	.52
	2 by 12	180	27	35.7	20.3	3,721	.71	5,276	.64	1,642	1.03	256	.77
	2 by 10	180	26	32.9	21.6	3,160	.60	4,699	.57	1,593	1.00	189	.57
	2 by 8	180	29	33.6	17.6	3,593	.69	5,352	.65	1,607	1.01	171	.51
	2 by 2	24	568	30.4	11.6	5,227	1.00	8,280	1.00	1,597	1.00	333	1.00
Douglas fir (fire-killed)	8 by 16	180	30	36.8	10.9	3,503	.80	4,994	.64	1,531	.94	330	1.19
	2 by 12	180	32	34.2	17.7	3,489	.80	5,085	.66	1,624	.99	247	.89
	2 by 10	180	32	38.9	18.1	3,851	.88	5,359	.69	1,716	1.05	216	.78
	2 by 8	180	31	37.0	15.7	3,403	.78	5,305	.68	1,676	1.02	169	.61
	2 by 2	30	290	33.2	17.2	4,360	1.00	7,752	1.00	1,636	1.00	277	1.00
Shortleaf pine	8 by 16	180	12	39.5	12.1	3,185	.73	5,407	.70	1,438	1.03	362	1.40
	8 by 14	180	12	45.8	12.7	3,234	.74	5,781	.75	1,494	1.07	338	1.31
	8 by 12	180	24	52.2	11.8	3,265	.75	5,503	.71	1,480	1.06	277	1.07
	5 by 8	180	24	47.8	11.5	3,519	.81	5,732	.74	1,485	1.06	185	.72
	2 by 2	30	254	51.7	13.6	4,350	1.00	7,710	1.00	1,395	1.00	258	1.00
Western larch	8 by 16	180	32	51.0	25.3	3,276	.77	4,632	.64	1,272	.97	298	1.11
	8 by 12	180	30	50.3	23.2	3,376	.79	5,286	.73	1,331	1.02	254	.94
	5 by 8	180	14	56.0	25.6	3,528	.83	5,331	.74	1,432	1.09	169	.63
	2 by 2	28	189	46.2	26.2	4,274	1.00	7,251	1.00	1,310	1.00	269	1.00
Loblolly pine	8 by 16	180	17	45.8	6.1	3,094	.75	5,394	.69	1,406	.98	383	1.44
	5 by 12	180	94	60.9	5.9	3,030	.74	5,028	.64	1,383	.96	221	.83
	2 by 2	30	44	70.9	5.4	4,100	1.00	7,870	1.00	1,440	1.00	265	1.00
Tamarack	6 by 12	162	15	57.6	16.6	2,914	.75	4,500	.66	1,202	1.05	255	1.11
	4 by 10	162	15	43.5	11.4	2,712	.70	4,611	.68	1,238	1.08	209	.91
	2 by 2	30	82	38.8	14.0	3,875	1.00	6,820	1.00	1,141	1.00	229	1.00
Western hemlock	8 by 16	180	39	42.5	15.6	3,516	.80	5,296	.73	1,445	1.01	261	.92
	2 by 2	28	52	51.8	12.1	4,406	1.00	7,294	1.00	1,428	1.00	284	1.00
Redwood	8 by 16	180	14	86.5	19.9	3,734	.79	4,492	.64	1,016	.96	300	1.21
	6 by 12	180	14	87.3	17.8	3,787	.80	4,451	.64	1,068	1.00	224	.90
	7 by 9	180	14	79.8	16.7	4,412	.93	5,279	.76	1,324	1.25	199	.80
	3 by 14	180	13	86.1	23.7	3,506	.74	4,364	.62	947	.89	255	1.03
	2 by 12	180	12	70.9	18.6	3,100	.65	3,753	.54	1,052	.99	187	.75
	2 by 10	180	13	55.8	20.0	3,285	.69	4,079	.58	1,107	1.04	169	.68
	2 by 8	180	13	63.8	21.5	2,989	.63	4,063	.58	1,141	1.08	134	.54
	2 by 2	28	157	75.5	19.1	4,750	1.00	6,980	1.00	1,061	1.00	248	1.00
Norway pine	6 by 12	162	15	50.3	12.5	2,305	0.82	3,572	0.69	987	1.03	201	1.17
	4 by 12	162	18	47.9	14.7	2,648	.94	4,107	.79	1,255	1.31	238	1.38
	4 by 10	162	16	45.7	13.3	2,674	.95	4,205	.81	1,306	1.36	198	1.15
	2 by 2	30	133	32.3	11.4	2,808	1.00	5,173	1.00	960	1.00	172	1.00
Red spruce	2 by 10	144	14	32.5	21.9	2,394	.66	3,566	.60	1,180	1.02	181	.80
	2 by 2	26	60	37.3	21.3	3,627	1.00	5,900	1.00	1,157	1.00	227	1.00
White spruce	2 by 10	144	16	40.7	9.3	2,239	.72	3,288	.63	1,081	1.08	166	.83
	2 by 2	26	83	58.3	10.2	3,090	1.00	5,185	1.00	998	1.00	199	1.00

TABLE 2.—*Compression and shear tests on green material.*

Species.	Compression ∥ to grain.						Compression ⊥ to grain.					Shear.		
	Size of specimen.	Number of tests.	Per cent of moisture.	Cr. str. at E. L., per square inch.	M. of E., per square inch.	Cr. str. at max. ld., per square inch.	Stress area.	Height.	Number of tests.	Per cent of moisture.	Cr. str. at E. L., per square inch.	Number of tests.	Per cent of moisture.	Shear strength.
	Inches.			*Lbs.*	*1,000 lbs.*	*Lbs.*	*Inches.*	*In.*			*Lbs.*			*Lbs.*
Longleaf pine	4 by 4	46	26.3	3,480	.....	4,800	4 by 4	4	22	25.3	568	44	21.8	973
	2 by 2	14	34.7	.....	.....	4,400	.....	.....	.....	.....	.....	.....	.....	.....
Douglas fir	6 by 6	515	30.7	2,780	1,181	3,500	4 by 8	16	259	30.3	570	531	29.7	765
	5 by 6	170	30.9	2,720	2,123	3,490	.....	.....	.....	.....	.....	.....	.....	.....
	2 by 2	902	29.8	3,500	1,925	4,030	.....	.....	.....	.....	.....	.....	.....	.....
Douglas fir (fire-killed)	6 by 6	108	34.8	2,620	1,801	3,290	6 by 8	16	24	33.7	368	77	35.8	631
	2 by 2	204	37.9	.....	.....	3,430	.....	.....	.....	.....	.....	.....	.....	.....
Shortleaf pine	6 by 6	95	41.2	2,514	1,565	3,436	5 by 8	16	12	37.7	361	179	47.0	704
	5 by 8	23	43.5	2,241	1,529	3,423	5 by 8	14	12	42.8	366	.....	.....	.....
	2 by 2	281	51.4	.....	.....	3,570	5 by 8	12	24	53.0	325	.....	.....	.....
	.....	.....	.....	.....	.....	.....	5 by 5	8	24	47.0	344	.....	.....	.....
	.....	.....	.....	.....	.....	.....	2 by 2	2	277	48.5	400	.....	.....	.....
Western larch	6 by 6	107	49.1	2,675	1,575	3,510	6 by 8	16	22	43.6	417	179	40.7	700
	2 by 2	491	50.6	3,026	1,545	3,696	6 by 8	12	20	40.2	416	.....	.....	.....
	.....	.....	.....	.....	.....	.....	4 by 6	6	53	52.8	478	.....	.....	.....
	.....	.....	.....	.....	.....	.....	4 by 4	4	30	50.4	472	.....	.....	.....
Loblolly pine	8 by 8	14	63.4	1,560	365	2,140	8 by 4	8	16	67.2	392	121	83.2	630
	4 by 8	18	60.0	2,430	691	3,560	4 by 4	8	38	44.6	546	.....	.....	.....
	2 by 2	53	74.0	.....	.....	3,240	.....	.....	.....	.....	.....	.....	.....	.....
Tamarack	6 by 7	4	49.9	2,332	1,432	3,032	.....	.....	.....	.....	.....	24	39.2	668
	4 by 7	6	27.7	2,444	1,334	3,360	.....	.....	.....	.....	.....	.....	.....	.....
	2 by 2	165	36.8	.....	.....	3,190	.....	.....	.....	.....	.....	.....	.....	.....
Western hemlock	6 by 6	82	46.6	2,905	1,617	3,355	6 by 4	6	30	48.7	434	54	65.7	630
	2 by 2	131	55.6	2,938	1,737	3,392	.....	.....	.....	.....	.....	.....	.....	.....
Redwood	6 by 6	34	83.6	3,194	1,240	3,882	6 by 8	16	13	86.7	473	148	84.2	742
	2 by 2	143	72.1	3,490	1,222	3,980	6 by 6	12	14	83.0	424	.....	.....	.....
	.....	.....	.....	.....	.....	.....	6 by 7	9	13	74.7	477	.....	.....	.....
	.....	.....	.....	.....	.....	.....	6 by 3	14	13	75.6	411	.....	.....	.....
	.....	.....	.....	.....	.....	.....	6 by 2	12	12	66.5	430	.....	.....	.....
	.....	.....	.....	.....	.....	.....	6 by 2	10	11	55.0	423	.....	.....	.....
	.....	.....	.....	.....	.....	.....	6 by 2	8	12	56.7	396	.....	.....	.....
	.....	.....	.....	.....	.....	.....	2 by 2	2	186	75.5	569	.....	.....	.....
Norway pine	6 by 7	5	29.0	1,928	905	2,404	.....	.....	.....	.....	.....	20	26.7	589
	4 by 7	8	28.4	2,154	1,063	2,652	.....	.....	.....	.....	.....	.....	.....	.....
	2 by 2	178	26.8	.....	.....	2,504	.....	.....	.....	.....	.....	.....	.....	.....
Red spruce	2 by 2	58	35.4	.....	.....	2,750	2 by 2	2	43	31.8	310	30	32.0	758
White spruce	2 by 2	84	61.0	.....	.....	2,370	2 by 2	2	46	50.4	270	40	58.0	651

TABLE 3.—*Bending tests on air-seasoned material.*

Species.	Sizes.		Number of tests.	Per cent of moisture.	Rings per inch.	F. S. at E. L.		M. of R.		M. of E.		Calculated shear	
	Cross section.	Span.				Average per square inch.	Ratio to 2" by 2"	Average per square inch.	Ratio to 2" by 2"	Average per square inch.	Ratio to 2" by 2"	Average per square inch.	Ratio to 2" by 2"
	Inches.	*Ins.*				*Lbs.*		*Lbs.*		*1,000 lbs.*		*Lbs.*	
Longleaf pine	8 by 16	180	5	22.2	16.0	3,390	0.50	4,274	0.37	1,747	1.00	288	0.75
	6 by 16	132	1	23.4	17.1	3,470	.51	6,610	.57	1,501	.86	388	1.01
	6 by 10	177	2	19.0	8.8	4,560	.68	7,880	.68	1,722	.99	214	.56
	4 by 11	180	1	18.4	23.9	3,078	.46	8,000	.69	1,660	.95	251	.66
	6 by 8	177	6	20.0	13.7	4,227	.63	8,196	.71	1,634	.94	177	.46
	2 by 2	30	17	15.9	13.9	6,750	1.00	11,520	1.00	1,740	1.00	383	1.00
Douglas fir	8 by 16	180	91	20.8	13.1	4,563	.68	6,372	.61	1,549	.91	269	.64
	5 by 8	180	30	14.9	12.2	5,065	.76	6,777	.65	1,853	1.09	218	.52
	2 by 2	24	211	19.0	16.4	6,686	1.00	10,378	1.00	1,695	1.00	419	1.00
Shortleaf pine	8 by 16	180	3	17.0	12.3	4,220	.54	6,030	.50	1,517	.85	398	.98
	8 by 14	180	3	16.0	12.3	4,253	.55	5,347	.44	1,757	.98	307	.76
	8 by 12	180	7	16.0	12.4	5,051	.65	7,331	.60	1,803	1.01	361	.89
	5 by 8	180	6	12.2	22.5	7,123	.92	9,373	.77	1,985	1.11	301	.74
	2 by 2	30	67	14.2	13.7	7,780	1.00	12,120	1.00	1,792	1.00	404	1.00
Western larch	8 by 16	180	23	18.3	21.9	3,343	.57	5,440	.53	1,409	.90	349	.96
	8 by 12	180	29	17.8	23.4	3,631	.62	6,186	.60	1,549	.99	295	.81
	5 by 8	180	10	13.6	27.6	4,730	.80	7,258	.71	1,620	1.04	221	.61
	2 by 2	30	240	16.1	26.8	5,880	1.00	10,254	1.00	1,564	1.00	364	1.00
Loblolly pine	8 by 16	180	14	20.5	7.4	4,195	.81	6,734	.72	1,619	1.10	462	1.45
	6 by 16	126	4	20.2	5.0	2,432	.47	4,295	.46	1,324	.90	266	.84
	6 by 10	174	3	21.3	4.7	3,100	.60	6,167	.66	1,449	.99	173	.54
	4 by 12	174	4	19.8	4.7	2,713	.52	5,745	.61	1,249	.85	185	.58
	8 by 8	180	9	22.9	4.9	2,903	.56	4,557	.48	1,136	.77	93	.29
	6 by 7	144	2	21.1	5.0	2,990	.58	4,968	.53	1,286	.88	116	.36
	4 by 8	132	8	19.5	9.1	3,384	.65	6,194	.66	1,200	.82	196	.62
	2 by 2	30	123	17.6	6.6	5,170	1.00	9,400	1.00	1,467	1.00	318	1.00
Tamarack	6 by 12	162	5	23.0	15.1	3,434	.45	5,640	.43	1,330	.82	318	.75
	4 by 10	162	4	14.4	9.7	4,100	.54	5,320	.41	1,356	.84	252	.59
	2 by 2	30	47	11.3	16.2	7,630	1.00	13,080	1.00	1,620	1.00	425	1.00
Western hemlock	8 by 16	180	44	17.7	17.8	4,398	.69	6,420	.62	1,737	1.04	406	1.06
	2 by 2	28	311	17.9	19.4	6,333	1.00	10,369	1.00	1,666	1.00	382	1.00
Redwood	8 by 16	180	6	26.3	22.4	3,797	.79	4,428	.57	1,107	.96	294	1.05
	6 by 12	180	6	16.1	17.7	3,175	.66	3,353	.43	728	.64	167	.60
	7 by 9	180	6	15.9	15.2	3,280	.69	4,002	.51	1,104	.96	147	.53
	3 by 14	180	6	13.1	24.4	.....	.....	5,033	.64	.....	.....	291	1.04
	2 by 12	180	5	13.8	14.4	3,928	.82	5,336	.68	1,249	1.09	260	.93
	2 by 10	180	5	13.8	24.8	3,757	.79	4,606	.59	1,198	1.05	186	.67
	2 by 8	180	6	13.7	20.7	4,314	.90	5,050	.65	1,313	1.15	166	.60
	2 by 2	28	122	15.2	18.8	4,777	1.00	7,798	1.00	1,146	1.00	279	1.00
Norway pine	6 by 12	162	5	16.7	8.1	2,968	.56	5,204	.61	1,123	.97	286	1.02
	4 by 10	162	5	13.7	12.0	5,170	.98	6,904	.82	1,712	1.48	317	1.13
	2 by 2	30	60	14.9	11.2	5,280	1.00	8,470	1.00	1,158	1.00	281	1.00

TABLE 4.—*Compression and shear tests on air-seasoned material.*

Species.	Compression ∥ to grain.						Compression ⊥ to grain.				Shear.		
	Size of specimen.	Number of tests.	Per cent of moisture.	Cr. str. at E. L., per square inch.	M. of E., per square inch.	Cr. str. at max. ld., per square inch.	Stress area.	Height.	Number of tests.	Per cent of moisture.	Cr. str. at E. L., per square inch.	Number of tests.	Per cent of moisture.	Shear strength per square inch
	Inches.			*Lbs.*	*1,000 lbs.*	*Lbs.*	*Inches.*	*In.*			*Lbs.*			*Lbs.*
Long-leaf pine	4 by 5	46	26.3	3,480	.....	4,800	4 by 5	4	22	25.1	572	52	20.2	984
Douglas fir	6 by 6	259	20.3	3,271	1,038	4,258	4 by 8	16	44	20.8	732	465	22.1	822
	2 by 2	247	18.7	3,842	1,084	5,002	4 by 8	10	32	18.1	584	.....	.....	.....
	.....	.....	.....	.....	.....	.....	4 by 4	8	51	20.2	638	.....	.....	.....
	.....	.....	.....	.....	.....	.....	4 by 4	6	49	24.0	613	.....	.....	.....
	.....	.....	.....	.....	.....	.....	4 by 4	4	29	24.8	603	.....	.....	.....
Short-leaf pine	6 by 6	29	15.7	4,070	1,951	6,030	8 by 5	16	4	17.8	725	85	.....	1,135
	2 by 2	57	14.2	.....	.....	6,380	8 by 5	14	3	16.3	757	.....	.....	.....
	.....	.....	.....	.....	.....	.....	8 by 5	12	5	15.1	730	.....	.....	.....
	.....	.....	.....	.....	.....	.....	5 by 5	8	6	13.0	918	.....	.....	.....
	.....	.....	.....	.....	.....	.....	2 by 2	2	57	13.9	926	.....	.....	.....
Western larch	6 by 6	112	16.0	.....	.....	5,445	8 by 6	16	17	18.8	491	193	15.0	905
	4 by 4	81	14.7	.....	.....	6,161	8 by 6	12	18	17.6	526	.....	.....	.....
	2 by 2	270	14.8	.....	.....	5,934	5 by 4	8	22	13.3	735	.....	.....	.....
Loblolly pine	6 by 6	23	.....	3,357	1,693	5,005	8 by 5	16	12	19.8	602	156	11.3	1,115
	5 by 5	10	22.4	2,217	545	2,950	8 by 5	8	7	22.9	679	.....	.....	.....
	4 by 8	8	19.4	3,010	633	3,920	4 by 5	8	8	19.5	715	.....	.....	.....
	2 by 2	69	.....	.....	.....	5,547	.....	.....	.....	.....	.....	.....	.....	.....
Tamarack	6 by 7	3	15.7	2,257	1,042	3,323	2 by 2	2	57	16.2	697	60	14.0	879
	4 by 7	3	13.6	3,780	1,301	4,823	.....	.....	.....	.....	.....	.....	.....	.....
	4 by 4	57	14.9	3,386	1,353	4,346	.....	.....	.....	.....	.....	.....	.....	.....
	2 by 2	66	14.6	.....	.....	4,790	.....	.....	.....	.....	.....	.....	.....	.....
West hemlock	6 by 6	102	18.6	4,840	2,140	5,814	7 by 6	15	25	18.2	514	131	17.7	924
	2 by 2	463	17.0	4,560	1,923	5,403	6 by 6	6	26	16.8	431	.....	.....	.....
	.....	.....	.....	.....	.....	.....	4 by 4	4	6	15.9	488	.....	.....	.....
Redwood	6 by 6	18	16.9	.....	.....	4,276	8 by 6	16	5	25.4	548	95	12.4	671
	2 by 2	115	14.6	.....	.....	5,119	6 by 6	12	6	14.7	610	.....	.....	.....
	.....	.....	.....	.....	.....	.....	7 by 6	9	5	14.8	500	.....	.....	.....
	.....	.....	.....	.....	.....	.....	3 by 6	14	2	12.6	470	.....	.....	.....
	.....	.....	.....	.....	.....	.....	2 by 6	12	2	16.2	498	.....	.....	.....
	.....	.....	.....	.....	.....	.....	2 by 6	10	4	14.3	511	.....	.....	.....
	.....	.....	.....	.....	.....	.....	2 by 6	8	2	13.2	429	.....	.....	.....
	.....	.....	.....	.....	.....	.....	2 by 2	2	145	13.8	564	.....	.....	.....
Norway pine	6 by 7	4	15.2	2,670	1,182	4,212	2 by 2	2	36	10.0	924	44	11.9	1,145
	4 by 7	2	22.2	3,275	1,724	4,575	.....	.....	.....	.....	.....	.....	.....	.....
	4 by 4	55	16.6	3,048	1,367	4,217	.....	.....	.....	.....	.....	.....	.....	.....
	2 by 2	44	11.2	.....	.....	7,550	.....	.....	.....	.....	.....	.....	.....	.....

NOTE.—Following is an explanation of the abbreviations used in the foregoing tables:
F. S. at E. L. = Fiber stress at elastic limit.
M. of E. = Modulus of elasticity.
M. of R. = Modulus of rupture.
Cr. str. at E. L. = Crushing strength at elastic limit.
Cr. str. at max. ld. = Crushing strength at maximum load.

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ASSOCIATION STANDARD GRADES

RULES FOR THE GRADING OF WESTERN SOFT PINE, IDAHO WHITE PINE, FIR AND LARCH LUMBER

Reported by the Bureau of Grades and Adopted by the

WESTERN PINE MANUFACTURERS' ASSOCIATION

PREFACE

The accompanying rules were adopted by the Western Pine Manufacturers' Association on February 2, 1910, upon the recommendation of its Bureau of Grades.

The manufacturers of Western Soft Pine, Idaho White Pine, Fir and Larch lumber have been for some years grading under the rules of the Northern Pine Manufacturers' Association, and have demonstrated the entire practicability of grading and placing on the market all Western Soft Pine, Idaho White Pine, Fir and Larch lumber under one rule.

The rules in this book are, accordingly, based on the Northern Pine Rules, with such changes and modifications as appeared necessary in order to clearly describe the defects existing in the above western woods, and not described in the Northern Pine Rules.

These rules express, as nearly as it is possible to define them, the grades of lumber being made under the supervision of the Bureau of Grades of the Western Pine Manufacturers' Association, and its corps of inspectors, and do not change in any way the standards of value represented by existing grades. These grades have been manufactured for some time in the territory between the Rocky Mountains on the East, the Cascade Mountains on the West, the British Columbia line on the North, and to and including the State of Oregon on the South, under the supervision and inspection of the Bureau of Grades.

The descriptions which follow are based on wide and continuous experience in this territory, and their aim is to portray more clearly the defects and characteristics peculiar to the woods of this region.

GRADES AND NOMENCLATURE

The following are the standard grades adopted and the names by which they are to be known:

Thick Finishing

1¼, 1½ and 2 inch.

B Select and Better.
C Select.
D Select.

Inch Finishing

B Select and Better.
C Select.
D Select.

Siding

B and Better.
C
D
E

Flooring

B and Better.
C
D

Factory Plank or Shop Common

No. 1 Shop.
No. 2 Shop.
No. 3 Shop.
Inch Shop.
Short Box.

Factory Selects

Factory A Select and Better.
Factory B Select.
Factory C Select.

Thick Common Lumber

Tank Stock.
Select Common.
Step Plank.

No. 1 Fencing, D&M Flat Common.
No. 2 Fencing, D&M No. 1 Box.
No. 3 Fencing, D&M No. 2 Box.

Shiplap, Grooved Roofing and D&M

No. 1 Common.
No. 2 Common.
No. 3 Common.

Dimension

No. 1.
No. 2.
No. 3 or Cull.

Common Boards

No. 1 Common.
No. 2 Common.
No. 3 Common.

No. 4 Common.
No. 5 Common.

Fencing

No. 1 Fencing.
No. 2 Fencing.
No. 3 Fencing.
No. 4 Fencing.

Lath

No. 1.
No. 2.

RULES FOR GRADING WESTERN SOFT PINE, IDAHO WHITE PINE, FIR AND LARCH LUMBER

GENERAL INSTRUCTIONS

The aim of the uniform grading inspection is to harmonize the natural differences which exist in the characteristics of the different stocks co-operating in this Bureau, making lumber of the same grades, at the different manufacturing points, of practically equal value, whether the logs from which the lumber is cut are large or small, coarse knotted or fine knotted, black knotted, or red knotted, sound or pitchy.

1. No arbitrary rules for the inspection of lumber can be maintained with satisfaction. The variations from any given rule are numerous and suggested by practical common sense, so nothing more definite than the general features of different grades should be attempted by rules of inspection. The following, therefore, are submitted as the general characteristics of the different grades.

2. In the grading of finishing lumber in common practice, there is a recognized difference in classifying inch lumber, and lumber thicker than an inch.

3. A very large percentage of the one and one-fourth, one and one-half and two-inch lumber used for finishing purposes goes into work requiring each face to be shown, as in doors, sash, etc. With inch lumber, except shop common and partitions, the uses are quite different, the almost invariable practice being that one face of the board is shown and that face the better one.

4. The face side of the lumber is the side showing the best quality for appearance.

5. Defects in lumber should be distributed in proportion to the size of the piece. Long or wide pieces of the same grade may contain more and greater defects than shorter or narrower pieces. The same percentage should be observed in both long and short, wide and narrow.

6. Wane in lumber is a defect which cannot be described by rule with satisfaction, and, therefore must be left to the judgment of the grader.

7. In a general way, D&M stock, except No. 3, should have a good bearing on the back, and lumber S1S or S or S2S shows nearly a full face.

8. The lowering of grade on the face side on account of wane should be governed by grade, width and defects in the piece.

9. Due consideration in rough stock should be given for the amount of wane that would be surfaced off in milling.

10. Lumber must be accepted on grade in the form in which it was shipped. Any subsequent change in manufacture or mill work will prohibit an inspection for adjustment of claims, except with the consent of all parties interested.

11. Mixed width boards do not necessarily require as good edges as shiplap or dressed and matched stock of the same grade.

12. Planing mill work should be taken into consideration in all grades of dressed lumber, and its effect on a piece must be left largely to the judgment of the inspector.

13. Thick "C" Select, except for factory purposes, should be graded on its best side or face, not so much attention being given to the back, but in the grades of "B" Select and Better, the backs should, as a rule, be within one grade of the face.

14. The grade of partition should be determined from its poorer side.

15. Lumber when worked should be graded the same as the respective grades when in the rough.

16. Unless otherwise provided for, lumber worked two sides shall be graded from its better side or face; lumber worked one side shall be graded from its surfaced face.

17. The examples given in this book do not in all cases include all of the different types in any grade.

18. The interpretation of any grade is intended to cover all lumber between the next higher grade above, and the next grade below.

19. It is not contemplated by these rules to cover car siding and roofing, the grades of which should be determined by special agreement.

ASSOCIATION STANDARD GRADES

FINISHING

Bright sap shall not be considered a defect in any of the grades provided for and de-

scribed in these rules. The restriction or exclusion of bright sap constitutes a special class of material which can only be secured by special contract.

"B" SELECT AND BETTER

1. "B" Select and Better may be 4 inches or wider and shall consist of "B" Select and all the better product of the stock.

2. Knots, slight blue stain and slight traces of pitch or small season checks are admissible.

3. A four-inch or six-inch piece should show but very slight traces of pitch or season check. Wider pieces can have more pitch or season checks, but it should be local and not scattered over the face of the piece.

4. Slight blue stain is admissible when other defects are not of a serious nature, the amount of stain depending upon the width of the piece.

EXAMPLES

Example 1. Piece 1x8-16. Has a small knot near one end; other end has blue stain two inches wide on edge running out at four feet.

Example 2. Piece 1x8-16. Shows crossing stain across face of piece at one end six inches wide; at other end has one small knot.

Example 3. Piece 1x10-16. Has one inch of blue stain for one-third the length of the piece, one small knot at each end and one five-eighths inch knot near center of board.

Example 4. Piece 1x10-16. Has local pitch near one end and one small knot near other end.

Example 5. Piece 1x12-16. Has a small knot near each end, two and a half inches of medium blue stain for four feet on one edge. The reverse side has three inches of blue stain on both edges for five feet at one end.

Example 6. Piece 1x12-12. Scattered over the face of this board are six small tight knots varying in size from one inch to a small pin knot.

Example 7. Piece 1x10-16. The face of the piece is perfect; the reverse side shows wane on one edge for eighteen inches.

Example 8. Piece 1x12-16. Both edges of this board have mottled stain showing very light, varying in width from two to three inches and running full length of piece. No other defects are shown.

Example 9. Piece 1x20-16. Has rot stain three inches wide and eight inches long at one end, one three-quarter inch unsound knot at other end and two half-inch knots. The reverse side has same appearance, except a small streak of pitch and a half-inch of blue stain for four feet.

Example 10. Piece 1x14-16. Has two half-inch tight black knots; near the center a small pitch pocket which does not show through the board. The reverse side has three-quarter inch of wane for three feet and shows same knots as on face.

Example 11. Piece 2x12-16. Has one poor knot three-quarter inch in diameter but otherwise face is perfect. The reverse side shows blue stain on both edges three inches wide and four feet and one-half inch of wane for eight feet.

Example 12. Piece 2x14-16. At one end near edge has one and one-half inch knot; at other end very slight pitch for two feet, but not showing any defined pitch streak. Reverse side shows three inches of blue stain for eight feet.

Example 13. Piece 1x8-16. At one end shows light pitch for two feet running across one-half the face. One edge shows three inches of slight blue stain for eight feet. This piece also has three small tight knots not over one-half inch in diameter scattered over the face.

Example 14. Piece 1¼x14-16. Face side shows four inches slight mottled stain at one end, running out at four feet, but no other imperfections. Reverse side shows mottled stain over two-thirds of the piece. No knots in this piece.

Example 15. Piece 1¼x16-16. Face side shows five tight black knots well scattered, from one-half to one inch in diameter. Also three-fourths inch slight stain at one end running out at six feet.

Example 16. Piece 1x12-16. This is a Western Soft Pine piece and at first sight this board might be classed as a pitchy piece. It is a slash grain heart piece, showing the red and white grain, a common type in Western Soft Pine, and is free from all defects except a season check ten inches long near one end.

"C" SELECT

1. "C" Select may be 4 inches or wider.

2. This grade will admit of quite serious defects if the piece retains at the same time a fair appearance.

3. The defects admissible are the same as those in "B" Select, but exist to a greater degree.

4. Medium blue stain covering one-third of the face if not in combination with other marked defects will be admitted.

EXAMPLES

Example 1. Piece 1x8-16. Shows three inches of blue stain for two feet and three

small knots. The reverse side shows blue stain in four places.

Example 2. Piece 1x8-16. Has eight small knots scattered over the face; otherwise perfect.

Example 3. Piece 1x8-16. Shows three feet light pitch on one edge at one end and one foot of rather heavy pitch at other end; no other defects.

Example 4. Piece 1x10-16. Bright and smooth appearance, but has three feet of fine pitch in center of board about three feet from one end.

Example 5. Piece 1x10-16. Has five very small knots well scattered, a season check near one edge and an inch of blue stain for two feet on the end of other edge.

Example 6. Piece 1x10-16. The face is free from defect except three and a half inches of blue stain for eight feet on one edge. The reverse side shows quite an amount of blue stain.

Example 7. Piece 1x12-16. Has two inches of blue stain on each edge, two one-inch tight knots and two one-half inch knots. Reverse side shows slight stain clear across one-quarter of the piece.

Example 8. Piece 1x12-16. Has a very smooth appearance, but shows pitch clear through for three feet at one end and four small tight knots.

Example 9. Piece 1x12-16. This is a White Pine piece, and has fifteen small pin knots, none of them more than one-quarter inch in diameter, well scattered; piece is perfectly bright and smooth in appearance.

Example 10. Piece 1x12-16. Quite smooth in appearance with pitch four inches wide tapering off at one-third the length of the piece. At other end of piece, pitch across the face for eighteen inches; the pitch, however, is not massed and under ordinary conditions will not run.

Example 11. Piece 1x14-16. Has four inches of light blue stain for five feet on one edge and a season check twelve inches long near one end. Reverse side shows one pitch pocket one-quarter inch wide and four inches long and a little more blue stain than is shown on face.

Example 12. Piece 1x14-16. Has one three-quarter inch poor knot and three half-inch black knots. Also four feet of slight traces of pitch at one end. Reverse side shows same knot and pitch defects, and a small season check.

Example 13. Piece 1x18-16. At first sight this board appears to be clear, but closer examination shows light pitch scattered over one-half the face. No other defects.

Example 14. Piece 1x16-16. Has eight small knots scattered over the face; two are one inch in diameter and the others are from half-inch to a pin knot; two of these knots are not firmly set.

Example 15. Piece 1x14-14. Within one foot of one end is a one and one-quarter inch black knot; also a quarter-inch black knot, and scattered over the face are two half-inch and two pin knots.

Example 16. Piece 1¼x12-16. Face has blue stain three inches wide on one edge for ten feet; other edge has three inches of blue stain for two feet; no other defect. Reverse side shows blue stain over full width for eight feet.

Example 17. Piece 1½x20-16. Face shows worm holes sixteen inches from end in center, one three-quarter inch black knot three feet from end on edge, a one-half inch black knot in center and seven feet from other end, within twelve inches of same end, one red knot three-quarters by one and one-half inches near edge, and one-half inch of wane on one edge. Reverse side shows same knot defects somewhat larger and some season check.

Example 18. Piece 1¼x16-16. Has two feet of fine season checks across the face at one end, one and a half inches of fine pitch on edge extending for four feet, another trace of pitch on edge near opposite end, also a one and one-quarter inch loose knot and one and one-quarter inches of dead sap tapering out at four feet.

Example 19. Piece 1½x16-16. Has two feet of very light pitch across the face at one end, one and one-half inches of it on one edge extending for four feet. Another trace of pitch near opposite end, and on same end one and three-quarter inches soft, rotten knot, and one and three-quarter inches of dead sap tapering off at four feet. At center of piece are two three-eighths inch knots. Reverse side shows same rotten knot and blue stain two and one-half inches wide the whole length of one edge. The other edge has two inches of blue stain for two feet.

Example 20. Piece 1½x18-16. The face has nine black knots from one-quarter to one-half inch in diameter, well scattered; one of the half-inch knots is loose. Also has one and one-half inches of blue stain full length on one edge, and a small amount of pitch two feet from one end. Reverse side shows five of the half-inch knots that run through from the face, and three inches of dead sap the entire length of one edge.

Example 21. Piece 1x10-14. Has one tight knot one and three-quarter inches in diameter and one one-half inch black knot and one pitch pocket one-quarter by three inches long, all well scattered.

"D" SELECT

1. "D" Select may be 4 inches or wider.
2. This grade admits any piece of lumber that has the appearance of finishing or a percentage of cutting in which the defects are too numerous or too serious to admit of being graded in "C" Select.
3. Medium blue stain covering the entire face, when not in combination with other marked defects, will be admitted.
4. Pitch pockets, pitch streaks, season checks or two or three large knots when not in serious combination. In White Pine many pieces are found having quite a number of small pin knots. This description embraces one inch, one and one-fourth inch, one and one-half inch and two inch stock and is graded strictly from the face without regard to the back and cannot be recommended for quality.

EXAMPLES

Example 1. Piece 1x10-16. Face shows a great deal of pitch scattered for two-thirds of the length and three spots of rough mill work. The pitch, however, does not show in solid mass or heavy pitch streaks, and while considered the limit of pitch the piece is very smooth in appearance.

Example 2. Piece 1x4-16. Very smooth in appearance, no knots, but has fine pitch over two-thirds of the face, with some blue stains on each edge at one end.

Example 3. Piece 1x8-16. Shows medium blue stain over the entire face; no other defects.

Example 4. Piece 1x8-16. Has one one and one-half inch black knot three feet from one end, a one-inch black knot at two feet from other end near edge; also a small pitch pocket near center. This is considered a cutting "D" Select.

Example 5. Piece 1x10-16. Face shows blue stain for two-thirds the length; at eighteen inches from one end has one one-inch black knot.

Example 6. Piece 1x12-16. Face shows blue stain for four feet at one end; near center are two half-inch knots; other end shows fine season checks in center for three feet.

Example 7. Piece 1x12-16. Dressed two sides. This piece shows a good "C" Select face. The reverse side shows six patches scattered the length of the board that have dressed, but practically speaking, this side has failed to dress, but no portion of the piece shows a thinness that will interfere with the uses to which this grade of lumber is usually put.

Example 8. Piece 1x12-16. This is a White Pine piece and has twenty-four small knots scattered over the face; four of them are one-half inch in diameter and the balance are smaller; good, smooth looking piece.

Example 9. Piece 1x12-16. Has six knots one-half to one inch in diameter and fourteen knots less than one-half inch in diameter; a little blue stain on one edge. Other edge has one inch slight blue stain. This board is perfectly sound and smooth in appearance.

Example 10. Piece 1x10-16. Has twenty sound red knots scattered over the entire face that will average less than one inch in diameter. Edges are square and piece is sound.

Example 11. Piece 1x8-16. At one end in a space of three feet there are three black knots one-half inch in diameter and one red knot three-quarters inch in diameter. The center contains two pin knots. At the end and within a space of five feet there are eight sound red knots with centers slightly checked, two being one inch in diameter, two a half inch in diameter and four are pin knots.

SIDING

General Instructions

1. Beveled Siding should be graded from the face side only.
2. Defects on the thin edge, which will cover when laid, should not be given the same consideration as defects elsewhere.

"B" AND BETTER SIDING

1. "B" and Better Siding shall consist of "B" Siding and all the better product of the stock.
2. "B" and Better Siding will admit of two or three sound tight knots, not to exceed one-half inch in diameter, well scattered over the face of the piece, or in the absence of knots a small amount of blue stain, or slight traces of pitch if local.

EXAMPLES

Example 1. Piece 7-16x5¼-16. Shows heavy pitch spot one inch long on thin edge, a torn defect on same edge that covers when laid, a pitch pocket one-quarter inch wide by one and one-quarter inches long.

Example 2. Piece 7-16x5¼-16. Has four small smooth knots, one-quarter inch and less in size, within four feet of one end near thin edge, and a half-inch, round, red knot within two inches of thick edge and six feet from same end.

Example 3. Piece 7-16x5¼-16. Has a

large curl four feet from one end and one one-half inch sound knot.

Example 4. Piece 7-16x5¼-16. Has a black knot on thin edge that will cover, a one-half inch tight black knot one inch from thick edge and two pin knots that show.

Example 5. Piece 7-16x5¼-16. This piece has three light crossing stains, but is otherwise perfect.

Example 6. Piece 7-16x5¼-16. Has a three-quarter inch sound knot five feet from one end and slight roughness in milling; otherwise perfect.

Example 7. Piece 7-16x5¼-16. Has a one-half by three-quarter inch tight knot on thick edge three feet from one end.

Example 8. Piece 7-16x5¼-16. Has slight traces of pitch for one foot at one end; other end shows very small season check three inches long which is barely perceptible.

Example 9. Piece 7-16x5¼-16. This piece is free from all imperfections.

Example 10. Piece 7-16x5¼-16. Has light blue stain for one foot at one end; within three feet of other end is one three-eighths inch black knot.

Example 11. Piece 7-16x5¼-16. This piece has very slight mottled stain extending for six feet. These spots are hardly noticeable; piece is otherwise perfect.

"C" SIDING

1. "C" Siding will admit of two or three small knots, not exceeding one inch in diameter, or more knots when smaller, or a slight amount of pitch, or light season check is admissible.

2. Medium blue stain covering one-third the face is admitted if not in combination with other marked defects.

3. Defects requiring one cut not to exceed four inches of waste are allowed in high line pieces twelve feet long and longer.

EXAMPLES

Example 1. Piece 7-16x5¼-16. Has a three-quarter inch black knot five feet from one end. A small pitch pocket and a very little local pitch within twelve inches of same end of piece.

Example 2. Piece 7-16x5¼-16. Has a half-inch black knot on thick edge five feet from end, and at seven feet another same sized knot. Within five feet of the other end is a half-inch loose knot and one-quarter inch of blue stain for six feet on thick edge.

Example 3. Piece 7-16x5¼-16. Has light blue stain extending over the whole face for five feet; no other defects are shown.

Example 4. Piece 7-16x5¼-16. Has a one-half inch black knot three feet from one end that partly covers when laid, a pitch streak six inches long four feet from same end, a three-quarter inch red knot five feet from same end, and at other end two feet of pitch that will cover when laid.

Example 5. Piece 7-16x5¼-16. Has five pin knots well scattered. On thick edge is one inch of blue stain for six feet, and on thin edge a little pitch that nearly covers when laid.

Example 6. Piece 7-16x5¼-16. Has three knot holes on thin edge that will cover when laid, and four black knots one-quarter inch to one-half inch in diameter well scattered.

Example 7. Piece 7-16x5¼-16. Has one and one-half inches of blue stain on thick edge for ten feet; also a three-quarter inch knot on thin edge.

Example 8. Piece 7-16x5¼-16. Has a one and one-half inch black, coarse, knot six feet from end; otherwise nearly perfect. This is considered a cutting strip.

Example 9. Piece 7-16x5¼-16. At first sight this piece appears to be perfect, but closer examination shows slight season checks scattered over nearly one-half of face.

Example 10. Piece 7-16x5¼-16. Has slight blue stain for two feet at one end; other end shows slight pitch in center for three feet; otherwise perfect.

"D" SIDING

1. "D" Siding will admit of considerable pitch and season check; with or without either of these defects a piece may have a number of small knots well scattered.

2. Blue stain covering the entire piece is allowed if not in combination with other marked defects.

EXAMPLES

Example 1. Piece 7-16x5¼-16. One-third of face has blue stain and scattered over the piece are a few small pin knots.

Example 2. Piece 7-16x5¼-16. Has three black knots one inch in diameter, and a slight touch of pitch.

Example 3. Piece 7-16x5¼-16. Looks to be clear, but contains considerable pitch.

Example 4. Piece 7-16x5¼-16. Has twelve small red knots and black knots, well scattered, in size from one-quarter to one-half inch.

Example 5. Piece 7-16x5¼-16. Has medium blue stain covering the entire face and one small pin knot.

Example 6. Piece 7-16x5¼-16. The face of this piece is covered with medium blue stain for seven feet; also a small pitch streak near one end.

Example 8. Piece 7-16x5¼-16. Has blue

stain for four feet at one end; other end shows season check for three feet.

Example 9. Piece 7-16x5¼-12. Shows a foot of blue stain on one end; near center is defect requiring one cut showing four-inch waste; other end shows slight pitch for two feet.

Example 10. Piece 7-16x5¼-16. At five feet from end shows knot hole requiring cut. Near center of piece for three feet has blue stain covering entire face of piece; six feet from other end shows knot hole requiring cut; between this cut and same end is one one-half inch knot.

"E" SIDING

1. This is the lowest recognized grade of Beveled Siding and will admit of stain, knot, pitch pockets, pitch and season check; defects not admissible in "D" Siding.

2. Many pieces showing seriously defective mill work or imperfect manufacture are admitted in this grade.

FLOORING

1. "B" and Better Flooring shall consist of "B" Flooring and all the better product of the stock.

2. "B" and Better Flooring will admit of two or three sound, tight knots from one-quarter to one-half inch in diameter, or in the absence of other defects, a small amount of blue stain.

EXAMPLES

Example 1. Piece 1x6-16. Free from all defects except a rough spot caused by dressing.

Example 2. Piece 1x6-16. One edge slightly stained one-half inch wide for three feet, and a small tight pin knot less than one-half inch in diameter.

Example 3. Piece 1x6-14. At first sight this piece appears perfectly clear, but close inspection shows a very slight touch of pitch near one end.

Example 4. Piece 1x6-16. Has two small knots six feet apart; one is a red knot and the other a sound, tight black knot; one is full half-inch in diameter and the other smaller.

Example 5. Piece 1x6-16. This piece is free from all defects, except a slight season check four inches long.

"C" FLOORING

"C" Flooring will admit of two sound, tight knots one inch in diameter, or three to five sound tight knots one-half inch and less in diameter, or in the absence of knot defects, medium blue stain, or slight traces of pitch, or season check, if not in serious combination.

EXAMPLES

Example 1. Piece 1x6-14. Has a one-inch tight black knot near center of piece, one three-eighths inch black knot six feet from one end, and one one-quarter inch tight knot four feet from same end.

Example 2. Piece 1x6-16. At eight inches from end has one three-eighths inch knot; at three feet has a one-quarter inch knot; at centre two three-eighths inch knots; all being sound and tight.

Example 3. Piece 1x6-14. Contains three small pin knots well scattered, and a small pitch pocket three-eighths inch long near one end; near other end is eighteen inches of very light pitch; smooth appearance.

Example 4. Piece 1x6-16. Has five small sound knots, the largest being one-quarter inch in diameter.

Example 5. Piece 1x6-14. Has eight small pin knots about the size of a lead pencil; otherwise perfect.

Example 6. Piece 1x6-16. Has light touch of pitch near one end; other end has three feet of light blue stain; fine appearance.

"D" FLOORING

1. "D" Flooring is a grade between No. 1 Fencing D&M and "C" Flooring, and will admit in a general way the imperfections of both grades.

2. In a knotty type the knots must be smaller and fewer in number than in No. 1 Fencing, and may be either red or black.

3. Medium blue stain covering the entire face is admitted, small pitch streaks or light season check, if not in serious combination.

4. Defects requiring one cut, not to exceed four inches of waste, are allowed in high line pieces twelve feet long and longer.

EXAMPLES

Example 1. Piece 1x6-16. Has blue stain over the entire face; otherwise perfect.

Example 2. Piece 1x6-16. Has blue stain across the face for four feet in center of piece, and two half-inch knots at two feet from each end.

Example 3. Piece 1x6-16. Fine appearance, but has fine pitch scattered over one-third the length.

Example 4. Piece 1x6-16. Has light stain one foot long near one end, and at six feet from end has a large loose knot; this is considered a cutting strip.

Example 5. Piece 1x6-16. Has eight small knots, the largest not over one-half inch in diameter; all well set.

Example 6. Piece 1x6-16. Has ten small knots, all red, and well scattered, averaging one-half inch in diameter. If the knots had been somewhat larger this piece would have graded No. 1.

Example 7. Piece 1x6-14. Has blue stain three inches wide extending full length of piece, and small pin knot near center.

Example 8. Piece 1x6-16. At first sight appears to be clear, but on examination shows very fine season checks scattered over the face for six feet.

No. 1 FENCING, D&M

This should be simply No. 1 Fencing worked to flooring and of the character, when worked, described under the title of No. 1 Common strips.

EXAMPLES

Example 1. Piece 1x6-16. Has twenty-two sound red knots, one being a horn knot three-quarters by four inches long; two knots in middle, side by side, are three-quarters of an inch in diameter, and the balance of knots are one-half inch and less in size.

Example 2. Piece 1x6-16. Has four sound red knots, the two largest being three-quarters inch by one and one-half inches, and is perfectly sound.

Example 3. Piece 1x6-16. There are seven round black knots and two red knots in this piece, the red knots being three-quarters inch in diameter and located near one end. The largest black knot is one and one-quarter inches in diameter and four feet from same end; the balance of knots are one-half inch and less, and well scattered; there is also a little pitch at opposite end from large knot and is considered a liner between No. 1 and No. 2 Fencing on account of having a combination of defects mentioned.

Example 4. Piece 1x6-16. Has eighteen sound knots, about one-half being black and tight, and ranging in size from one-half to one inch in diameter; it is perfectly sound and is considered a good No. 1 strip.

Example 5. Piece 1x6-16. Has thirteen sound red knots, averaging three-quarters inch in diameter, and ten sound red knots one inch in diameter. At the center a little pitch is shown; also one foot of wane on tongue; four of the red knots have slightly checked centers.

Example 6. Piece 1x6-16. This is a sound heart piece containing seven red knots; one is a pitch knot, well set, and the balance are of a small horn type.

Example 7. Piece 1x6-14. Has five perfectly sound red knots, one and one-half inches in diameter, and seventeen small red knots, one-quarter to three-quarters inch in diameter. This is a typical piece of No. 1 Fencing.

Example 8. Piece 1x6-14. Has six sound red horn knots, running from each edge and nearly meeting; these knots do not impair the strength of the piece.

Example 9. Piece 1x6-16. Has a small cluster of black knots at center, two one-half by one-inch black knots near one end and nine other small knots, well scattered; all sound and tight.

Example 10. Piece 1x6-16. Has seven small red knots averaging one inch in diameter; near one end shows a small amount of pitch heart about eighteen inches long, but it is not deep.

Example 11. Piece 1x6-16. Has twenty-two small sound knots, the two largest being about one inch in diameter on the back; at center of the piece slight wane shows on both edges for thirteen inches, but not enough to impair the tongue or groove.

Example 12. Piece 1x6-16. Has one one-half inch knot three feet from one end; one three-eighths knot four feet from other end; one five-eighths knot near center; all knots sound and firmly set. The entire face of this piece has light blue stain.

No. 2 FENCING, D&M

This should be simply No. 2 Fencing worked to flooring and of the character, when worked, described under the title of No. 2 Common Strips.

EXAMPLES

Example 1. Piece 1x6-14. Has eight black knots; three are one-half inch in diameter within three feet of one end, and one of them is an edge knot; the other five knots are one and one-half inches in diameter, scattered over the face of the piece; at the opposite end from the large knots is a one-half inch hole where a knot has sloughed off in working.

Example 2. Piece 1x6-14. Has seven small black knots and would readily be admitted in D Flooring were it not that three of the knots are loose.

Example 3. Piece 1x6-12. At one end has a pitch streak averaging three-quarters inch wide for five feet; at opposite end a pitch pocket three inches long, and three one-inch knots.

Example 4. Piece 1x6-14. Has four black knots averaging one inch in diameter, two pitch knots one and one-half inches wide by four inches long. All well scattered over the face.

Example 5. Piece 1x6-16. At one end has

a one and one-half inch sound red knot and one one-half inch red knot, both having checked centers. The center has two one-inch sound red knots and part of a one and one-half inch loose knot on grooved edge. Scattered over the face within six feet of other end are ten sound pin knots and three two-inch sound red knots.

Example 6. Piece 1x6-16. Has twenty-two black knots scattered over the face, three being loose, and on one edge a little pitch. None of these knots are over one inch in diameter.

Example 7. Piece 1x6-16. This is a smooth looking strip, its principal defect being pitch extending over two-thirds of the face; also five small knots well scattered and a half-inch edge knot hole.

Example 8. Piece 1x6-16. This is a sound small knotted piece and would be No. 1 if it were not that a knot one-half inch by one inch is gone out of the edge.

Example 9. Piece 1x6-16. Is coarse in appearance on account of two large limb knots extending across the face. Knots are red and do not seriously impair the strength of the piece.

Example 10. Contains nine knots from one-half to one inch in diameter; part of them are black and one edge knot is partly broken out in dressing. On one edge is a slight trace of rot, but piece is of a very sound character.

Example 11. Piece 1x6-16. Has sound red knots of all sizes up to two inches and has one inch of black stain for six inches on one edge. This is considered a fine type of No. 2.

Example 12. Piece 1x6-16. Has fourteen small knots, six of which are black. The piece has in addition three, well scattered, open seasoning checks that extend through the strip, and each is four inches in length. The appearance and quality are both in this piece of Flooring.

Example 13. Piece 1x6-16. This is a smooth looking sound knotted piece and would grade No. 1 were not the entire face covered with blue stain.

No. 3 FENCING, D&M

No. 3 Fencing D&M is the regular grade of No. 3 Fencing worked to flooring and may contain coarse knots, an occasional knot hole, splits, wane, worm holes, streaks of rot, and a great deal of pitch or season checks, and any amount of stain, but not a serious combination of these defects.

EXAMPLES

Example 1. Piece 1x6-14. Has black knots five-eighths to one inch in diameter, three feet from one end; knot sloughed off edge one-half to five-eighths inch five inches from same end and on same edge knot five-eighths by one and one-quarter inches is sloughed off.

Example 2. Piece 1x6-16. If free from pitch this piece would grade No. 1 Fencing Flooring, but has heavy pitch across the face for one-half the length of piece.

Example 3. Piece 1x6-16. Has a one-inch knot hole four feet from one end; scattered over the face are ten knots, in size from one to two inches in diameter, two of them being loose.

Example 4. Piece 1x6-16. Has eight small rotten knots with firm rot stain extending from one knot to the other along the whole length of the piece. This piece has a decidedly unsound appearance at the first glance.

Example 5. Piece 1x6-16. Has four good-sized branch knots on face, with some heart shake along grooved edge; also three-quarters inch of wane for two feet at one end of face. The back is also waney on both edges, so much so for half the length that the piece is almost slabby.

COMMON LUMBER

1. The characteristic of Common Lumber, as distinguished from Finishing, consists of a general coarseness of appearance, caused by various defects and combination of defects in a greater or less degree, according to the grade.

2. Checked knots in tight red knotted stock in Common Lumber is not considered a defect, unless the opening is so pronounced as to injure the piece, for the purpose for which the grade was designed.

No. 1 COMMON BOARDS AND STRIPS

1. No. 1 Common Boards and Strips includes all sound tight knotted stock, whether red or black knots, free from very large, coarse knots, or any imperfections that will weaken the piece.

2. This grade should be of a character fitting it for ordinary use, except finishing purposes.

3. Knots, small pitch pockets, light season check or light pitch are admissible if they do not affect the general utility of the piece.

Light blue stain covering the entire face is admissible if not in combination with other marked defects.

EXAMPLES

Example 1. Piece 1x12-16. Has five red knots from one and one-half to two inches

in diameter; also fifteen small knots, all sound and well scattered and varying in size from a half inch to an inch and a quarter. This is a typical No. 1 Common.

Example 2. Piece 1x12-16. There are a great many knots in this piece, but they are well distributed and are sound and tight. Six of them are red, from one and one-half to two inches in diameter; seven more red knots, about one and one-half inches, and four small tight black knots not over an inch in diameter.

Example 3. Piece 1x10-16. This piece worked four sides. Has twenty-four small knots; an angling three-eighths inch knot has fallen out on the edge on the face side; the reverse side shows a small patch that failed to dress.

Example 4. Piece 1x8-16. Has eight red knots from an inch to an inch and a half in diameter; each knot shows a small check across it and the piece shows light blue stain full length on one edge. This is a very smooth looking piece.

Example 5. Piece 1x8-16. Worked to drop siding. Has four red knots about one and one-fourth inches in diameter, and eleven small sound red knots, in size from one-half to one inch in diameter.

Example 6. Piece 1x8-16. Worked to shiplap. Has seven red knots about an inch in diameter and fifteen smaller ones ranging from one-fourth to one inch in diameter. The entire face is covered with light blue stain, but piece is sound and has smooth appearance for No. 1.

Example 7. Piece 1x10-14. This piece has six sound firmly set knots, from one-fourth to one inch in diameter, well scattered; there are also several very small season checks; these checks, however, are very fine and the board is sound and of good appearance.

No. 2 COMMON BOARDS AND STRIPS

1. No. 2 Boards and Strips are subject to the same general inspection as No. 1, except that coarser and larger knots, not necessarily sound, more pitch, pitch pockets and season checks are allowed. V and coarse limb knots, heart shake or slight traces of rot when firm, or occasional worm holes, are defects admissible in this grade.

2. Blue stain covering the entire face of the piece is admissible when not in combination with other marked defects.

EXAMPLES

Example 1. Piece 1x12-16. Has seven red knots with checked centers. These knots vary in size from one and one-half to two and one-half inches in diameter, and eight smaller knots. A portion of the center of one of the checked knots has broken out in dressing.

Example 2. Piece 1x12-16. Very smooth in appearance; looks like a "D" Select; contains a large number of small black knots, two of which are not firmly set.

Example 3. Piece 1x20-16. Has six large branch or V-shaped knots, all red, from one and one-quarter and one and one-half inches wide, and from three to four inches long; also a half dozen smaller red knots from one to two inches in diameter.

Example 4. Piece 1x16. Has four large branch knots, all black but tight, a little heart shake or season check, a touch of red stain for three feet; also eight or ten small knots well scattered.

Example 5. Piece 1x10-14. Has nine knots, both red and black, from one and one-half to two inches in diameter; at least a dozen smaller knots from one-half to one and one-quarter inches, both red and black, all well scattered and firmly set.

Example 6. Piece 1x12-14. Contains ten red knots from two to three inches in diameter, and a half dozen smaller ones, all sound; also a single grub or worm hole.

Example 7. Piece 1x6-16. Has a great deal of blue stain, with a dozen small knots, both red and black; well scattered and firmly set.

Example 8. Piece 1x6-16. Has two red knots, two inches in size, four knots averaging an inch, and a half dozen small ones. Type of a good No. 2.

Example 9. Piece 1x6-16. Has a streak of very firm red rot, about one inch wide, running six feet in length from one end; also a half dozen small knots well scattered. The rot is barely perceptible in the rough strip and is therefore of a smoother appearance than the average No. 2 Fencing Strip.

Example 10. Piece 1x6-16. Has three large worm holes and considerable pitch; both well scattered. In appearance very smooth and an acceptable grade whether used rough or D&M.

Example 11. Piece 1x12-14. The face contains a large number of sound knots, and would be No. 1 were it not that it also has about a half dozen worm or grub holes, well scattered. If it were ten inches wide, fewer worm holes would be admitted.

Examples 12. Piece 1x12-16. Has a dozen small knots, and a like number of small pitch pockets scattered over the face, the largest of these pitch pockets being one-quarter by three inches long.

No. 3 COMMON BOARDS AND STRIPS

1. The general appearance of this grade of lumber is coarse, admitting:

2. Large loose or unsound knots.
3. An occasional knot hole.
4. A great deal of pitch and pitch pockets.
5. Some red rot and pieces that are badly season checked.
6. Large worm holes and any amount of blue stain.
7. Not a serious combination of these defects in any one piece is admissible.

EXAMPLES

Example 1. Piece 1x18-16. Badly split at one end for six feet and sprinkled with a dozen knots.

Example 2. Piece 1x12-16. Has heavy pitch scattered over the whole board, but not in solid masses; also a half dozen small knots.

Example 3. Piece 1x12-14. Has ten large knots from two to three inches in diameter; some of them are not firmly set; also a half-dozen small knots and a split one foot in length at one end.

Example 4. Piece 1x12-16. Has six large branch knots which materially weakens the piece and gives it a very coarse appearance.

Example 5. Piece 1x10-14. Worked to shiplap. Has four black knots about one and one-half inches in diameter, and one knot hole of like size.

Example 6. Piece 1x10-14. Has eight small knots one inch in diameter. These knots are black and some of them are loose. If knots were sound, the board would pass for a "D" Select.

Example 7. Piece 1x10-14. Worked to shiplap. Has four large pitch pockets; one is two inches wide by four inches long; the others are somewhat smaller. Also a half dozen small knots.

Example 8. Piece 1x10-16. Worked to shiplap. One end smooth looking; has a few small knots. The other end shows three feet containing red rot from four to six inches wide.

Example 9. Piece 1x8-16. Worked to shiplap. Shows a dozen small black knots and red rot of a firm texture over one-third of its face.

Example 10. Piece 1x10-16. Worked to shiplap. Has knot defects as are found in No. 1 Common, but also has a dozen large worm holes well scattered, which make it No. 3.

Example 11. Piece 1x10-14. Worked to shiplap. Has four large black knots three inches in diameter, one of them loose; also a few pin knots and some blue stain.

Example 12. Piece 1x10-16. Full of coarse knots, all sound, but is so extremely coarse in appearance that the board is classed as No. 3. Without two or three of these coarse knots, it would be a satisfactory No. 2.

Example 13. Piece 1x8-12. Worked to shiplap. This piece is badly season checked, has the knot defects of a No. 1 Common and has good appearance.

Example 14. Piece 1x6-16. Has one inch of wane on one edge and considerable blue stain; also a small knot hole one inch in diameter, and a large coarse knot.

Example 15. Piece 1x6-16. Has pitch streak near one end, from one to three inches wide and four feet long; other end shows considerable season check.

Example 16. Piece 1x6-16. Has three coarse black knots from two to three inches in diameter.

Example 17. Piece 1x10-14. Has one large sound knot two and one-half inches in diameter at one end. Two feet from same end has loose knot three-quarters inch in diameter, and five feet from same end has dead sap two inches wide on each edge for four feet; also two good-sized worm holes, one knot hole three-quarters by one inch, and six feet from one end one sound red knot one and one-half inches in diameter.

Example 18. Piece 1x12-16. Has fifteen pitch pockets of all sizes up to six inches long, and a half dozen small knots. This piece has a hard appearance, but is a good, strong, serviceable board.

Example 19. Piece 1x12-14. Has five large sound knots, in size from one and one-half to three inches in diameter; these knots have badly checked centers; about four feet from one end has a knot hole one and one-half inches in diameter, and an open pitch seam twelve inches long.

Example 20. Piece 1x8-14. Has several small black knots one-quarter to five-eighths inch in diameter, and three sound red knots from one and one-half to two inches in diameter. It also has two knot holes, one of them one and one-quarter by one and one-half inches in size, and is six feet from end of piece; the other is three-quarters by two inches and situated three feet from same end.

No. 4 COMMON BOARDS AND STRIPS

1. The predominating defects characterizing this grade is red rot and knot holes.
2. Other types are pieces showing numerous large worm holes, pieces that are extremely coarse knotted, waney, or showing excessive heart shake, extremely pitchy, or badly checked, or split.

EXAMPLES

Example 1. Piece 1x18-16. One half of this board has the general appearance of a

No. 2 Common. The other half is composed of red rot varying from firm to soft.

Example 2. Piece 1x12-16. Has six large knot holes, other knot defects are those of a No. 2 Common board.

Example 3. Piece 1x12-16. Has a great many large worm holes, considerable rot and a few coarse knots.

Example 4. Piece 1x12-14. Contains four large knot holes with other defects.

Example 5. Piece 1x12-16. Has the knot defects of No. 2 Common board, but contains a large number of large worm holes. No rot or knot holes in the piece.

Example 6. Piece 1x12-12. Very badly split in two or three places, no serious rot or knot defects, but board is badly shattered.

Example 7. Piece 1x10-16. Three-quarters of the face of this board shows heavy mass of pitch and a few knots.

Example 8. Piece 1x12-16. Shows the knot defects of a No. 2 Common board, but has excessive heart shake.

Example 9. Piece 1x4-16. Shows a good face, but is excessively waney on back, there being four feet of it showing all slab. Face equal to No. 2 in quality.

NO. 5 BOARDS.

No. 5 Boards is the lowest recognized grade and admits all defects known in lumber, provided the piece is strong enough to hold together when carefully handled.

JOISTS, SCANTLING AND TIMBER

NO. 1

No. 1 Joists and Scantling must be of a good, sound character, but will admit of defects that do not impair the strength of the piece.

2. On basis of 2x4, wane on edge is admissible one-half inch deep for half the length, or a proportionate amount for a shorter distance or on both edges. In any case, one side and two edges should allow a good nailing surface, it being understood, however, that the wane shall in no case extend over one-half the side of the piece.

3. A few worm holes are admissible.

4. Stain is not considered a defect.

5. Timbers and threee-inch plank admit proportionately greater defects.

6. Two-inch dimension and three-inch and thicker, and timbers, may consist of Pine, Fir and Larch in any proportion.

NO. 2

1. No. 2 will admit of large, coarse knots, not necessarily sound, considerable wane, also pitch, worm holes, red dozy streaks, crooked pieces and other defects which weaken or impair the piece to such an extent as to render it unfit for a No. 1 grade. Any amount of No. 2 Pine, Fir, or Larch is admissible in the grade.

NO. 3

No. 3 will admit of a great deal of rot and all the imperfections allowed in No. 1 and No. 2, but in a much more pronounced form. Any amount of No. 3 Pine, Fir and Larch is admissible.

THICK COMMON LUMBER

Common lumber, one and one-fourth inches and thicker, shall be graded the same as inch lumber.

TANK STOCK

1. Tank Stock shall be of dimension sizes, square edged, practically free from wane and pitch. The face should be practically free from season checks, the back can have a moderate amount if it does not impair the piece for Tank purposes, and may also have any number of sound water-tight knots.

2. White sap is not defect.

SELECT COMMON

1. Select Common shall be of dimension sizes and of a smooth, common appearance on the face side.

2. White sap shall not be considered a defect in this grade.

3. A slight amount of stain is admissible on the face, and any amount of sound stain on the back.

4. A small amount of pitch may show on the face when not in combination with other marked defects.

5. Any quantity of small sound knots, red or black, that do not give the piece too coarse an appearance are admissible.

6. The face of the piece should be practically free from wane, while the back may show a moderate amount as well as other defects.

STEP PLANK

Step Plank shall be Pine eight inches or wider, and shall be graded the same as No. 1 Common Boards.

FLAT COMMON

Flat Common shall be Pine six inches or wider and shall be graded the same as No. 2 Common Boards and Strips.

NO. 1 BOX

No. 1 Box shall be graded the same as No. 3 Common Boards and Strips.

NO. 2 BOX

No. 2 Box shall be graded the same as No. 4 Common Boards and Strips.

FACTORY LUMBER

Factory Plank.

1. Grades as described under this head are valued for cutting qualities only, and should not be confounded, either in quality or value, with grades outlined in another part of this book for yard purposes.
2. Factory plank of all kinds, better than No. 3 Shop, shall be graded for the percentage of Door Cuttings that can be obtained.
3. Two grades of Door Cuttings only shall be recognized, and are to be known as No. 1 and No. 2 Cuttings.
4. The only defect admissible in No. 1 Door Cuttings is white sap.
5. The grade of No. 2 Door Cutting will admit of one defect only in any one piece. This may be a small knot of sound character, not to exceed five-eighths of an inch in diameter, or the defect may be slight blue stain which does not extend over more than one-half the surface of the piece on one side, or in the absence of all other defects, one small season check not to exceed eight inches in length and showing on one side of the piece only, is admissible.

SHOP COMMON

No. 1 Shop Common. The sizes and grades of cuttings admissible in the grade of No. 1 Shop Common are as follows:

1. No. 1 Stiles in width 5¼ or 6 inches and in length from 6 feet 8 inches to 7 feet 6 inches.
2. No. 1 Rails, 9 to 10 inches wide and from 2 feet 4 inches to 3 feet in length.
3. No. 1 Muntins 5¼ inches wide and from 3 feet 6 inches to 4 feet in length.
4. Any number of pieces of either Stiles or Rails mentioned above are admissible in the grade of No. 1 Shop Common; but only two Muntins of the sizes mentioned above shall be considered, and one No. 2 Door Stile may also be considered, in securing the required percentage of cuttings in any given plank.
5. Each plank of No. 1 Shop Common shall contain not less than 50 per cent, nor more than 70 per cent of Door Cuttings of the sizes and grades above mentioned.

No. 2 Shop Common. The sizes admissible in No. 2 Shop Common are as follows:

1. Stiles in width 5¼ or 6 inches, and from 6 feet 8 inches to 7 feet 6 inches in length.
2. Rails 9 or 10 inches in width and from 2 feet 4 inches to 3 feet in length.
3. Top Rails 5¼ inches wide and from 2 feet 4 inches to 3 feet in length. Top Rails must, however, be of No. 1 Door Cutting quality, but figured as No. 2 Door Cuttings.
4. Muntins 5¼ inches wide and from 3 feet 6 inches to 4 feet in length.
5. Any number of cuttings of any one of the above sizes are admissible in the grade of No. 2 Shop Common.
6. Each plank of No. 2 Shop Common shall contain either one of the following: At least 25 per cent of No. 1 Door Cuttings, or not less than 40 per cent of all No. 2 Door Cuttings or not less than 33 1-3 per cent No. 1 and No. 2 Door Cuttings combined.

No. 3 Shop Common. One and one-fourth inches and thicker, will admit all below the grade of No. 2 Shop Common that is of a cutting type, and suitable for sash, door or other cuttings.

FACTORY SELECTS

Factory "C" Select and Better. The grade of Factory "C" Select and Better shall contain 70 per cent and more of No. 1 Door Cuttings in the sizes specified as admissible in No. 1 shop.

NOTE.—All factory plank shall be graded from the poor side, and in determining the percentage of door cuttings, consideration must be given to the fact that plank are to be ripped full length in such manner as will yield the highest grade and largest percentage of door cuttings before cross cutting, except in such cases where plank will yield a higher value by being first cross-cut for rails. In such instances as when stock is cross-cut for rails, where some of the stock so obtained is too poor for either No. 1 or No. 2 rails, and yet contains stiles or muntins, or top rails, which can be obtained by ripping this cross-cut stock, the door cuttings so obtained shall be figured in when determining percentages.

INCH SHOP COMMON

1. There shall be only one grade of inch Shop Common.
2. Cuttings shall be 9½ inches wide or wider and 18 inches long or longer, or, 5 inches wide or wider and 3 feet long or longer.
3. Cuttings 9½ inches wide or wider and less than 3 feet in length shall be from

defects free on both sides, except white sap.

4. Cuttings 5 inches wide or wider and 3 feet long or longer shall have a "C" Select or Better face.

5. Each piece of Inch Shop Common shall contain 50 per cent or more of any one cutting, or combination of cuttings, described in the foregoing rules for this grade.

SHORT BOX

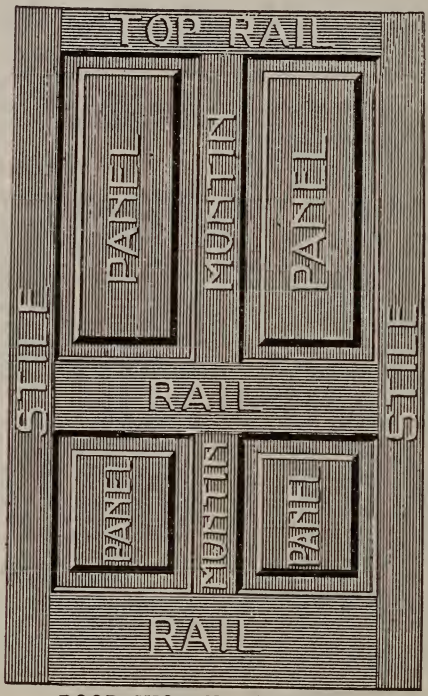
Short Box shall include lumber twelve to forty-seven inches long inclusive, three inches and wider, and No. 4 and better.

RULES FOR MEASUREMENT OF FACTORY PLANK

Factory Plank may be measured with either a rule or a tape line.

When a rule is used, the number of feet nearest the actual measurement shall be taken.

The additional thickness over inch shall be added to the surface measurement of the total amount measured.

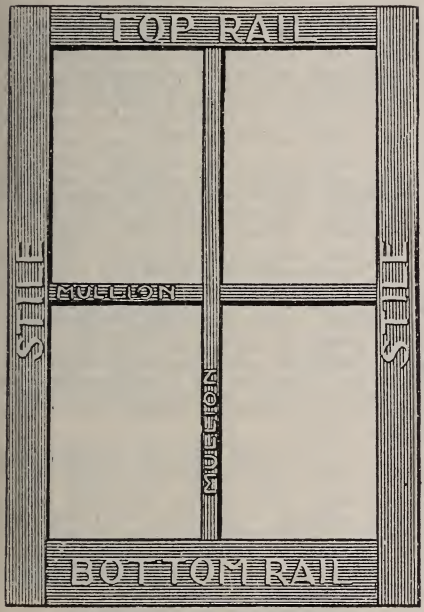


DOOR, SHOWING CUTTINGS.

DOOR CUTTINGS

The figures on the left of the brackets show the number of feet and decimal parts in each cutting.

The figures on the right show the number of feet and approximate fractions of a foot in each piece of cutting grouped within the various brackets. These fractional figures on the right of the brackets are sufficiently accurate for practical purposes and are to be used in computing the percentage of cuttings in a factory plank.



SASH, SHOWING CUTTINGS.

STILES.

5¼″ x 6′ 8″ — 2.92 ft. 5¼″ x 6′ 10″ — 2.99 “ 5¼″ x 7′ — 3.06 “	3
5¼″ x 7′ 2″ — 3.14 “ 5¼″ x 7′ 4″ — 3.21 “ 5¼″ x 7′ 6″ — 3.28 “ 6″ x 6′ 8″ — 3.33 “	3¼
6″ x 6′ 10″ — 3.42 “ 6″ x 7′ — 3.5 “ 6″ x 7′ 2″ — 3.56 “	3½
6″ x 7′ 4″ — 3.66 “ 6″ x 7′ 6″ — 3.75 “	3¾

MUNTINS

5¼" x 3' 6" — 1.53 ft	}	1½
5¼" x 3' 8" — 1.6 "		
5¼" x 3' 10" — 1.68 "	}	1¾
5¼" x 4' — 1.75 "		

RAILS.

9" x 2' 4" — 1.75 ft.	}	1¾
9" x 2' 6" — 1.875"		
9" x 2' 8" — 2. "	}	2
9" x 2' 10" — 2.125"		
9" x 3' — 2.25 "	}	2¼
10" x 2' 4" — 1.94 "	}	2
10" x 2' 6" — 2.08 "		
10" x 2' 8" — 2.22 "	}	2¼
10" x 2' 10" — 2.36 "		
10" x 3 — 2.5 "	}	2½

TOP RAILS.

5¼" x 2' 4" — 1.02 ft.	}	1
5¼" x 2' 6" — 1.09 ft.		
5¼" x 2' 8" — 1.17 ft.	}	1¼
5¼" x 2' 10" — 1.24 "		
5¼" x 3' — 1.31 "		

LATH

Owing to the rapidity with which Lath are manufactured and necessarily handled in grading the misplacement of an occasional piece is practically unavoidable. For this reason a variation of ten per cent or less off grade is provided for in our rules. This provision is intended to cover accidentally misplaced pieces only, and every reasonable effort should be made to have the grade conform to the specifications without regard to this percentage provided for misplaced pieces.

NO. 1 PINE LATH

1. No. 1 Pine Lath shall be butted to not less than thirty-one and three-fourths inches or forty-seven and three-fourths inches long, not more than one-eighth of an inch scant of one and one-half of an inch wide, and not more than one-sixteenth of an inch scant of three-eighths of an inch thick, and of sound material.

2. Will admit wane one-third the thickness, and one-third the width for one-third the length on one side of the piece or its equivalent otherwise located, when not in combination with other serious defects.

3. Any number of pin knots, three or four three-quarter inch knots well scattered, or more smaller knots, all well set, firm and sound, that do not weaken the piece, are admissible in four foot, and a proportionately less amount in a thirty-two inch No. 1 Lath.

4. Moderate pitch extending over one-half the surface of the piece that does not materially impair the usefulness is admissible when not in serious combination with other defects.

5. A few worm holes in an otherwise sound piece are admissible.

6. Stain shall not be considered a defect, although mould that has caused the surface of the piece to decay or scale off, is a defect not admissible in this grade.

7. Ten per cent or less of No. 2 Lath shall be allowed in this grade.

NO. 1 MIXED LATH.

No. 1 Mixed Lath shall be graded by the same rules and specifications, and subject to the same percentage of No. 2 given for No. 1 Pine Lath, and may consist of any two or more of the following named woods: Western Soft Pine, White Pine, Black Pine, Spruce, Fir, Cedar and Larch.

NO. 2 LATH.

1. No. 2 Lath may consist of any one or a mixture in any proportions of any two or more of the following named woods: Western Soft Pine, White Pine, Black Pine, Spruce, Fir, Cedar and Larch.

2. Pieces of No. 1 quality with an average of not more than one-fourth of an inch scant in width, and one-eighth of an inch scant in thickness are admissible.

3. No. 2 Lath may contain firm streaks and patches of rot, sound knots, an occasional loose knot or knot hole, dead wood, worm holes, wane, season checks, pitch and pitch pockets, that by themselves or in combination with these or other defects do not seriously impair the usefulness of the piece.

4. Both ends of a No. 2 Lath should have at least an inch in width of firm wood for nailing.

5. Ten per cent above or below this grade is admissible.

STANDARD MANUFACTURED SIZES

Adopted as Official, August 6, 1907.

THICK FINISH.

1¼" S2S to 1⅛"
1½" S2S to 1⅜"
2" S2S to 1¾"
1" Finish and Common S1S or S2S to ¾"
1" Finish and Common S4S to ¾"x½" less than rough size.

SHOP COMMON

1" S2S to ¾" and 1-32"
1¼" S2S to 1⅛" and 1-32"
1½" S2S to 1⅜" and 1-32"
2" S2S to 1¾" and 1-16"

SIDING.

1x4 to 7-16x3¼ face.
1x6 to 7-16x5¼ face.

FLOORING AND CEILING

1x4 to ¾"x3⅛" face.
1x6 to ¾"x5⅛" face.
1x8 to ¾"x7⅛" face.

DROP SIDING

1x4 to ¾"x3⅛" face.
1x6 to ¾"x5⅛" face.
1x8 to ¾"x7⅛" face.

SHIPLAP.

1x 8 to ¾"x 7" face.
1x10 to ¾"x 9" face.
1x12 to ¾"x11" face.

GROOVED ROOFING.

1x 8 to ¾"x 7½" face.
1x10 to ¾"x 9½" face.
1x12 to ¾"x11½" face.
2" plank S1S or S2S to 1⅝".
3" plank S1S or S2S to 2½".
Timbers S4S to ½" less than rough size.

DIMENSIONS AND TIMBERS

2x 4 S1S and E to 1⅝"x 3⅝"
2x 6 S1S and E to 1⅝"x 5½"
2x 8 S1S and E to 1⅝"x 7½"
2x10 S1S and E to 1⅝"x 9½"
2x12 S1S and E to 1⅝"x11½"
2x14 S1S and E to 1⅝"x13½"

WEIGHTS OF REDWOOD.

	Per M. ft. B. M.
Balusters, turned	1500
Balusters, beaded or S4S	1800
Bungalow Siding, 5/8"	1000
" " 3/4"	1250
Ceiling, 1/2" surface measure	850
Ceiling, 5/8" surface measure	1100
Ceiling, 1"	1600
Drop Siding and Shiplap	1800

FINISH, TANK & SILO STOCK	Rough	S2S
1/2" Surface Measure	1300	1200
5/8" Surface Measure	1700	1600
1 "	2400	2000
1 1/4" 1 1/2" & 2"	2600	2200
3 "	2900	2600
4 "	3000	2800

SQUARES & TURNING STOCK		
4x4	2800	2300
5x5 & 6 x 6	3200	2700
8x8 & 10x10	3600	3100
Flooring	1800	
Lattice	1800	
Lath	450	
Moulding	1600	
Pickets, per M. B. M.	1600	
RAIL		
1 1/4, 1 1/2 & 2" Square	1650	
2x3 & 4	1800	
3x3 & Up	2000	
Siding and Clapboards	700	

Stave Columns	4 ft.	6 ft.	8 ft.	9 ft.	10 ft.
6"		23	29	32	35
8"		34	43	47	50
10"		49	58	65	70
12"		55	68	75	83
Posts and Newels 4"	10		17	19	21
5"	15		27	30	33
6"	20		38	43	48

	Per M. Pcs.
Shingles 16" 5-1 3/4 Random	180
5" & 6" 5-1 3/4 Dimension	170
	Each
Doors 1 1/8	28
1 3/8	32
1 3/4	45

REDWOOD GRADING RULES

Siding

CLEAR.—Must be well manufactured and free from all defects excepting bright sap not over 1/2 inch in width on thin edge. Small amount of birdseye permissible.

SELECT.—Will allow slight roughness in manufacture and any amount of bright sap or birdseye. Will allow two sound knots not over 1/2 inch in diameter.

STANDARD.—Will allow any roughness that is not permitted in select grade; defects in manufacture, checks and raised slash grain stock. Any number small sound knots and not over two loose or unsound knots.

Finish

CLEAR.—This grade to be sound live lumber, and up to, and including 12 inches in width shall be on the face side free from all defects. Reverse side may contain one or two pin knots not exceeding 1/2 inch in diameter, or 1/2 inch bright sap on one edge and extending not over one-third of the length of the piece. Small amount of birdseye permissible.

Lumber 14 inches and wider must have one clear face excepting that sap in width [illegible] twelfth of the width of the piece and [illegible] tending not over one-third of length w[illegible] permitted in occasional boards. On th[illegible] verse side sap as above is no defect. [illegible] also allow on reverse side one or more pin knots, the diameter of no one knot over 1/2 inch. Small amount of birdseye missible.

Will allow splits or season checks n[illegible] ceeding in length one-half of the wid[illegible] of piece.

SELECT.—This grade shall be graded from the better side. Must be well manufactured, but will allow any amount of sap or birdseye when not accompanied by any other defect. Pieces 3 to 6 inches wide without sap will allow pin knots or discoloration on one side only. Pieces 8 inches and wider without sap will allow one or more sound knots whose total diameter shall not exceed 1 1/4 inches. Will allow season checks or splits not exceeding in length one-half the width of the piece.

Squares

CLEAR.—Same as finish, but may contain such defects as will not appear after working.

SELECT.—May contain any amount of sound bright sap or birdseye; not more than four sound knots 1 inch in diameter, or two sound knots 1 1/2 inches in diameter, depending on the size of the piece. Ordinary season checks or splits allowed.

Tank and Silo Stock

This grade may contain in addition to clear stock such pieces as will work watertight and without sap on face side.

Ship Lap, Drop Siding, Flooring and Ceiling

Same grades as finish. Defects appearing only on back do not affect grade.

SOUTHERN
CYPRESS MANUFACTURERS'
ASSOCIATION

Standard Grades and
Classifications of

CYPRESS

and

BAY POPLAR

(Tupelo)

Published at New Orleans, La.
June 10, 1914.
Office of Secretary, New Orleans, La.

GRADING RULES

For

CYPRESS LUMBER AND SHINGLES

Adopted November 23, 1905.

Amended June 10, 1914

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By the Southern Cypress Manufacturers'
Association.

GENERAL INSTRUCTIONS

The aim of these grading rules is to harmonize the natural differences which exist in the timber sawed at the various mills in this Association, in an effort to make the shipments of lumber from the different mills uniform and of equal intrinsic value, grade for grade.

To that end, cypress lumber shall be graded according to the following rules and specifications, bearing in mind that as no arbitrary set of rules and specifications can be maintained in every case, much must be left to the common sense and best judgment of the inspector.

Lumber shall be manufactured and shipped in standard lengths and thicknesses.

Tank, 1st and 2nd, worked partition, panel stock and the cuttings in No. 1 and No. 2 shop shall be graded from the poorer side.

Select lumber, flooring, ceiling, bevel siding and finishing shall be graded from the better or finished side, but the reverse side should in no case be more than one grade lower.

All lumber shall be tallied surface or face measure, the tally counted up, and the one-quarter or one-half added to the total where the lumber is one and one-quarter or one and one-half inches thick, and two inches and thicker to be multiplied by the thickness.

In the measurement of all lumber, fractions exactly on the one-half foot are to be given alternately to the buyer and the seller; the fractions below the one-half foot are to be dropped, and all fractions above the one-half foot are to be counted to the next higher figure on the board rule.

In "line boards," pieces 14′ and longer shall be given the advantage in grade; pieces 12′ and shorter shall be reduced in grade.

Recognized defects in cypress are knots, knot holes, shake, splits, wane, worm holes, stained sap and peck.

STANDARD DEFECTS

A standard knot is sound and not to exceed 1¼″ in diameter.

A small sound knot is one not exceeding ¾″ in diameter.

Two small knots not to exceed in extent or damage one 1¼″ knot.

One straight split not to exceed in length the width of the piece.

Worm holes not exceeding in damage one standard knot.

—

Ordinary season checks shall not be considered a defect in any grade.

Ordinary season checks are such as occur in lumber properly covered in yard, or season checks of equal size in kiln dried lumber.

Bright sap is not a defect in select or below.

Pin worm holes, sound knots and stained sap shall not be considered a defect in No. 1 barn or below.

STANDARD LENGTHS

All random standard length stock may be furnished in odd as well as even foot lengths, but there shall not be to exceed twenty per cent. of odd lengths in any one item.

Tank stock, shop, heart silo, sap silo, No. 1 barn, fencing and No. 1 boxing shall be 8′ and longer.

1st and 2nd and select shall be 10 to 20 ft.

Finish, flooring, ceiling, partition, bevel and drop siding shall be 10 to 20 ft.

Mouldings, panel stock and battens of all sizes 6 to 20 ft., in both odd and even foot lengths, but not exceeding 10 per cent of 6, 7, 8 and 9 foot lengths.

No. 2 barn and No. 2 boxing 6′ and longer.

Cull or peck 4′ and longer.

STANDARD FINISHED SIZES OF CYPRESS

All lumber shipped in the rough (except 8/4″ No. 1 and No. 2 "Dimension," which grades may be ¼ inch under or ¼ inch over the size specified, both in thickness and width) shall be of sufficient thickness or width to S2S or S2E to standard thickness or width, as follows—

4/4 lumber S1S or S2S shall be 13-16″ thick.

5/4 No. 1 and No. 2 shop, select, 1st and 2nd clear, selected common tank and tank lumber S1S or S2S, shall be 1⅛″ thick.

5/4 peck, No. 1 and No. 2 barn and boxing and finishing lumber S1S or S2S shall be 1 1-16″ thick.

6/4 No. 1 and No. 2 shop select 1st and 2nd clear, selected common tank and tank lumber S1S or S2S, shall be 1⅜″ thick.

6/4 peck, No. 1 and No. 2 barn and boxing, and finishing lumber S1S or S2S shall be 1 5-16″ thick.

8/4 lumber, except No. 1 and No. 2 barn or dimension S1S or S2S shall be 1¾″ thick.

8/4 No. 1 and No. 2 barn or dimension S1S or S2S shall be 1⅝″ thick.

10/4 lumber S1S or S2S shall be 2¼″ thick.

12/4 lumber S1S or S2S shall be 2¾″ thick.

All lumber S1E takes off ⅜″. S2E, ½″.

All flooring shall be S2S and C. M.

4/4 flooring shall be 13/16″ by 2¼″, 3¼″, 4¼″, 5¼″ face.

5/4 flooring shall be 1 1/16, 6/4 shall be 1 5/16, by same widths as 4/4.

⅜ ceiling shall be worked 5/16″, S1S only.

½ ceiling shall be worked 7/16″, S1S only.

⅝ ceiling shall be worked 9/16″, S1S only.

¾ ceiling shall be worked 11/16″, S1S only.

⅜″ panel stock S2S shall be 7/32″.

½″ panel stock S2S shall be 5/16″.

⅝″ panel stock S2S shall be 7/16″.

¾″ panel stock S2S shall be 9/16″.

5/4, 6/4, and 8/4 Turning Stock shall be worked to same finished thicknesses as lumber.

3″x3″ to 8″x8″ Squares S4S shall be ¼″ less than the rough sizes.

All widths of ceiling to be the same as flooring, unless otherwise specified. Ceiling up to 3¼″ face to have one bead on one edge and ceiling wider than 3¼″ face to be beaded center and edge.

Drop Siding—Sizes D. and M. shall be worked ¾″x3¼″ and 5¼″ face; shiplap worked ¾″x5″ face, 5½″ over all, patterns shown in moulding book, to be graded according to the rules for bevel siding.

Partition shall be worked ¾″x3¼″ and 5¼″ face.

No. 1 Shiplap, or D. and M. 8″, 10″, and 12″, shall be worked to 13-16″, 7″, 9″ and 11″ face, ½″ lap.

Grooved Roofing, 10″ and 12″ S1S and 2 E. 13-16″x9½″ and 11½″, size of groove ½″ wide, ¼″ deep, located 1 3/16″ from outer edge of the groove to edge of board.

Bevel siding or bevel cribbing shall be worked ½″ less in width than the rough strip measure.

TANK STOCK

This grade shall be random widths, and will not be furnished in specified widths, and shall be graded from the poorer side.

This grade shall be 5″ and wider, 1½″ to 4″ thick and 8′ and over in length. Pieces up to 7″ shall be free from sap. Pieces 7″ to 13″ may have 1″ of sound sap on one edge, not to exceed half the length and half the thickness of the piece. Pieces 14″ and wider may have 1″ of sound sap on both edges not to exceed half the length and half the thickness of the piece. In all widths sound knots that do not impair usefulness for tank purposes may be admitted.

FIRST AND SECOND CLEAR

This grade shall be random widths, and will not be furnished in specified widths, and shall be graded from the poorer side.

This grade may be 6″ and wider, 1″ to 4″ thick and 10′ and over in length. Pieces 6″ to 8″ may have ½″ of bright sap on each edge, or its equivalent on one or both edges, otherwise they must be clear. Pieces 8″ to 10″ may have 1″ of bright sap on each edge, or its equivalent on one or both edges, otherwise, they must be clear. Pieces 10″ and under 12″ may have 1½″ of bright sap on each edge or 3″ on one edge, and may have one standard knot or its equivalent. Pieces 12″ wide may have 2″ of bright sap on each edge, or 4″ on one edge and may have one standard knot; or, in lieu of sap, may have two standard knots or their equivalent. Pieces wider than 12″ may admit of defects as specified above in

proportion as width increases. Pieces 10" and wider may admit of one end split, which shall not exceed in length the width of the piece. Pieces 12" and less in width, free from other defects, may have bright sap across one face at one end, but this sap shall not exceed in length one-tenth of the length of the piece. In pieces 13" and wider bright sap is not a defect.

SELECTS

This grade shall be random widths, and will not be furnished in specified widths, and shall be graded from the better side, but the reverse side shall not be of a lower grade than No. 1 Shop or No. 1 Barn.

This grade may be 6" and wider, but will not be furnished wider than 12"; shall be 1" to 4" thick 10' and longer. Pieces 10" and under in width shall admit two standard knots or their equivalent and an additional standard knot or its equivalent for every 2" in width over 10". Pieces free from other defects, 10" and over in width, to admit pin worm holes on one edge one-tenth the width of the piece. Bright sap is not a defect in this grade. Slight wane on pieces 10" and over in width is allowed on one edge not over 3' in length. When no other defect appears, slight amount of stained sap may be allowed. Pieces 10" and wider may admit of one end split which shall not exceed in length the width of the piece.

SHOP

This grade shall be random widths, and will not be furnished in specified widths; shall be 5" and wider, 1" to 4" thick, 8' and longer, and shall be graded No. 1 and No. 2 shop. In both grades of shop, parts not included in the stipulated percentage of good cuttings may be thin and may be of any grade.

No. 1 SHOP

In this grade the 1" shall cut for shop use 60% or better of the following cuttings or rippings, or both: 5" wide or wider, by 3' long, or longer; and 9½" wide or wider, by 18" long, or longer; and strips 2" wide, or wider, ripped the entire length of the piece from pieces 8' to 12' long, and strips 2" wide or wider, 12' long or longer, ripped from pieces 14' long or longer. In this grade 1¼" and thicker shall cut for shop use 60% or better of the following cuttings or rippings, or both: 5¼" wide or wider, by 3' long or longer; 9" wide, or wider, by 2' 4" long or longer; and strips 2" wide or wider, ripped the entire length of the piece from pieces 8' to 12' long, and strips 2" wide or wider, 12' long or longer, ripped from pieces 14' long or longer. In the above cuttings bright sap shall be admitted.

No. 2 SHOP

This grade shall cut for shop use 40% to 60% of the same size cuttings or rippings, or both, as the corresponding thicknesses in No. 1 shop. In the above cuttings bright sap shall be admitted.

HEART SILO

This grade shall be in specified widths and lengths and graded from the better side, 4" and wider, 1" to 3" thick, 8 ft. and longer, and shall be an all heart water-tight grade. The face or better side will admit of sound knots. The reverse side will admit of such defects as are permitted in the grade of No. 1 Barn (except sap), which defects, however, shall not be coarse enough to prevent the use of each piece for tank or silo purposes.

SAP SILO

This grade is the same as heart silo with the exception that sound sap is not a defect and is recommended for oil tank or other purposes where sap is not objectionable.

No. 1 BARN OR DIMENSION

This grade shall be specified widths only, shall be 3" and wider, 1" and thicker, 8' and over in length, admitting sap, bright or stained, shake, season checks, knots, pin worm holes, straight end splits not exceeding in length the width of the piece, a small amount of peck on one side and one edge, or very slight peck on both sides and both edges of pieces, comparatively free from coarse defects; which defects, however, shall not be sufficient to seriously impair the strength, or prevent the use of each piece for "common" purposes in its full length and full width.

No. 2 BARN OR DIMENSION

This grade shall be specified widths, 3" and wider, 1" and thicker, 6' and over in length, admitting all the defects allowed in No. 1 barn, but same may be larger and coarser, and in addition will admit peck on both sides; however, the defects shall not be sufficient to prevent the use of each piece

in full length and full width for low grade fencing and other very common purposes.

FENCING AND SHEATHING

This grade shall be 1" thick and specified widths, 4", 6", 8", 10" and 12" wide, admitting all the defects allowed in the Barn grades and in addition will admit pieces containing knot holes, auger holes and other defects which will not sufficiently impair the strength of each piece to prevent its use for fencing or sheathing purposes.

BOXING

The boxing grades shall be random widths and will not be furnished in specified widths; shall be 3" and wider and 1" and thicker and shall be graded as No. 1 and No. 2 boxing. These are strictly cutting grades and must contain the percentage of sound cuttings stipulated for each grade. Sound cuttings shall have a minimum width of 3" and a minimum length of 18", and may contain knots, bright or stained sap, pin worm holes, shake, season checks, a small amount of peck on one side and one edge, or very slight peck on both sides and both edges of pieces comparatively free from coarse defects, which defects, however, shall not be sufficient to impair the strength of each sound cutting or prevent the use of such cutting for boxing, sheathing, crating or other common purposes. The waste material in boxing grades may be thin or absolutely worthless. The word "cutting" as here used is intended to include both cuttings and rippings.

No. 1 BOXING

This grade shall be 8' and over in length and shall contain 80 per cent or more of sound cuttings, no single cutting, however, to contain less than 144 square inches.

No. 2 BOXING

This grade shall be 6' and over in length and shall contain 60 per cent or more of sound cuttings, no single cutting, however, to contain less than 72 square inches.

CULL OR PECK

This grade may be random or specified widths 3" and wider, 1" to 4" thick, 4' and over in length. Shall admit all pieces below the grade of No. 2 boxing, and shall also admit the product of that part of the log known as "pecky"; however, each piece shall have sufficient strength and nailing surface to permit its use as a low grade boxing, crating, sheathing and foundation material.

FINISHING

Shall be specified widths 4" and wider, 1" to 2" thick, 10' and over long, and shall be graded from the better side A, B and C, but the reverse side should not be more than one grade lower. All grades of finish, rough or S1S or S2S may vary ¼" from the width specified.

"A" FINISH.—Pieces 4" and 5" wide shall be clear of sap, knots and other defects. Pieces 6" wide may have 1" of bright sap, or in lieu of sap one small sound knot. Pieces 7" and 8" wide may have 2" of bright sap, or in lieu of sap one small sound knot. Pieces 9" and 10" wide may have 3" of bright sap, or in lieu of sap two small sound knots, or 1½" of bright sap and one small sound knot. Pieces 12" wide may have 4" of bright sap, or in lieu of sap one standard knot, or two small sound knots, or 2" of bright sap and one small sound knot. Pieces 14" or wider may have more defects in proportion as the width increases.

"B" FINISH.—Pieces 4", 5" and 6" wide may have 2" of bright sap and one or two small sound knots, or in lieu of knots may have all bright sap. Pieces 7" and 8" wide may have 3" of bright sap and two small sound knots, or in lieu of knots may have all bright sap. Pieces 9" and 10" wide may have 4" of bright sap and one standard knot or three small sound knots, or in lieu of knots may have all bright sap. Pieces 12" wide may have 6" of bright sap and one standard or four small sound knots, or in lieu of knots may have all bright sap. This grade will not be furnished wider than 12".

"C" FINISH.—All widths in this grade shall admit small sound knots, stained sap, pin worms and other defects except shake, but none that will prevent the use of same in its full width and length as a paint grade. This grade will not be furnished wider than 12".

"D" FINISH.—All widths will admit sound knots, stained sap, pin worms, slight shakes, and other defects; but none that will prevent the use of same in its full width and length as a common paint grade. This grade will not be furnished wider than 12".

PANEL STOCK

Shall be ⅜" and thicker, 8" and wider, "B" and Better, and shall be graded from the poorer side.

SIDING

Siding shall be 4" and 6" in width, 10' to 20' in length, and graded from the finished side, A, B, C and D.

"A" SIDING.—May have 1" of bright sap on thin edge, and may contain one small sound knot.

"B" SIDING.—May have any amount of bright sap, or if not all bright sap, may have three small sound knots, shake, split, or pin worm holes not exceeding in damage the three small knots as above, and may have slight wane on the thin edge. In the absence of other defects a small amount of stained sap will be permitted.

"C" SIDING.—May have one to five knots, the whole not aggregating over 3" in diameter, or knots, splits or other defects that can be removed in two cuts with waste not exceeding 10% of the length, or may have small amount of stained sap and pin worm holes not exceeding in damage the five small knots above described, provided that not more than 20% of the pieces in any one shipment shall be of said cutting type. Short siding (4' to 8') shall contain no cuttings.

"D" SIDING.—May have stained sap and pin worm holes, or may have other defects that will not cause a waste to exceed one-third the piece, provided that not exceeding 30% of the pieces in any one shipment shall be of said cutting type.

FLOORING AND CEILING

Shall be specified widths, 10' to 20' in length and graded from the finished side, or if both sides are finished, it shall be graded from the better side, A, B, C and D.

"A"—May have bright sap on one edge one-fourth its width, otherwise must be clear.

"B"—May have one-half of its face bright sap if otherwise clear, or in lieu of sap, may contain two small sound knots, or may have a split not to exceed 9" at one end.

"C" (10 to 20 feet)—May have all bright sap, or may have one to five knots the whole not aggregating over 3", or knots or other defects that can be removed in two cuts with waste not exceeding 10% of the length, provided that not more than 20% of the pieces in any one shipment shall be of said cutting type, or may have three pin-worm holes, or may have check or split at one end, not to exceed 10% of the length.

"C" (4 to 9 feet)—May have all bright sap, small sound knots, stained sap, pin-worm holes and other defects except shake, but none that will prevent the use of each piece the full length.

"D"—May have stained sap and pin worm holes, or may have unsound knots or other defects that will not cause a waste to exceed one-third the piece, provided that not exceeding 30% of the pieces in any one shipment shall be of said cutting type.

PARTITION

Shall be same widths and lengths as flooring and ceiling, but shall be graded from the poorer side, A. B. C. and D, same grading to apply as in flooring and ceiling.

PICKETS

Shall be graded No. 1 and No. 2.

1"x1" shall be Headed and S4S to 13-16" x13-16".

1¼"x1¼" shall be Headed and S4S to 1 1-16"x1 1-16".

1½"x1½" shall be Headed and S4S to 1 5-16"x1 5-16".

1"x3" shall be Headed and S4S to ¾"x 2½".

No. 1.—Shall be well manufactured, bright sap no defect and many contain one small sound knot.

No. 2.—Shall admit stained sap, sound knots, pin worm holes, slight shake, and pickets thrown out of the No. 1 grade because of poor manufacture.

BATTENS

Battens, both flat and O. G., are not mouldings. Same are invariably used with "common" lumber and shall, therefore, be graded No. 1 barn and better, admitting all defects allowed in No. 1 barn, but none that will prevent the use of each piece in full length for Batten purposes. ⅝" Battens shall be 1" strips S2S to 13-16"x2½" and resawed, or 1"x2¾" to 3" S2S and resawed. Unless otherwise specified, ⅝" or flat battens shall be S2S only and resawed.

O. G. Battens shall be manufactured in the sizes and pattern shown in the Universal Moulding Book.

TURNING SQUARES

Sizes, 4x4 to 8x8. Lengths, 8' and longer.

Will admit one-quarter their size in sap on one corner, showing on two faces, and may contain one to five small sound knots.

CAR ROOFING AND SIDING

"C AND BETTER" GRADE.—This grade will admit sound knots, stained sap, pin-worm holes, very slight shake and other defects, but none that will prevent the use

of each piece in its full width and length for car roofing and car siding; may be random or specified lengths and may be worked to pattern specified and graded from pattern side or S2S and C M and graded from the better side.

CAR LINING

Shall be specified widths and 8 to 20 feet in length. Will admit tight knots, stained sap, pin-worm holes, slight shake and other defects, but none that will prevent the use of each piece in its full width and length for car lining purposes.

SHINGLES

BESTS.—A dimension shingle, 4, 5 and 6" in width, 16" long, each width packed separately, 5 butts to measure 2", to be all heart and free of shake, knots and other defects.

PRIMES.—A dimension shingle, 4, 5 and 6" in width, 16" long, each width packed separately, 5 butts to measure 2", admitting tight knots and sap, but free of shake and other defects, but with no knots within 8" of the butts.

This grade may contain shingles clipped two-thirds of the width and one-eighth of the length on the point.

STAR A STAR.—A random width shingle 3" and wider, 14" to 16" long, otherwise the same as primes.

ECONOMY.—Dimensions 4, 5 and 6", each width separately bunched, admitting sap and sound knots, may have slight peck 5" from butts, imperfections on points no objection and admitting 14" shingles.

CLIPPERS.—All shingles below the above grades which are sound for 5" from the butts, worm holes and slight peck excepted, random widths 2½" and wider, admitting 12" shingles which are otherwise at least one grade higher.

The count of our manufacture of shingles, of all grades, is based on 4,000 lineal inches in width, making 1,000 standard shingles, consequently there would be only 667 6" shingles packed and counted as 1,000 standard shingles; 5" dimension being counted in like proportion.

In making re-inspections of shingles, one bundle out of 20 bundles taken at random, shall be cut open, the results of this investigation to form the basis of arriving at the grade of the entire shipment.

WEIGHTS OF CYPRESS

	Pounds per M.		
	Green	Rough or S1S S2S Dry	Dry
Lumber 2½" and 3"	5,000	3,500	2,900
Lumber 2"	5,000	3,200	2,600
Lumber 1½", 1¼" and 1"	5,000	3,000	2,400
1" Lumber, Rough, Resawed		2,800	
1" Lumber, Rough, Resawed twice		2,700	
1" Lumber, S2S and Resawed			2,250
1" Lumber, Resawed and S2S afterwards			2,000
2" Lumber, Rough, Resawed twice		2,800	
⅜" Panel Stock			1,100
½" Panel Stock			1,400
⅝" Panel Stock			1,700
¾" Panel Stock			2,200
Worked Flooring, Partition, Drop Siding, Shiplap Moulded Casing and Base			2,200
⅜" Ceiling			1,600
½" Ceiling			1,300
⅝" Ceiling			1,000
½" Bevel Siding			1,000
Shingles, all grades			300
Lath, ¾"			500
Lath, ⅝"			900
Byrkit's Sheathing Lath			1,500
1"x1"—4' Pickets, Headed and S4S to 13-16"x13-16"			800
1¼"x1¼"—2' Pickets, Headed and S4S to 1 1-16"x1 1-16"			600
1¼"x1¼"—3' Pickets, Headed and S4S to 1 1-16"x1 1-16"			900
1¼"x1¼"—4' Pickets, Headed and S4S to 1 1-16"x1 1-16"			1,200
1½"x1½"—2' Pickets, Headed and S4S to 1 5-16"x1 5-16"			1,000
			Dry
1½"x1½"—3' Pickets, Headed and S4S to 1 5-16"x1 5-16"			1,500
1½"x1½"—4' Pickets, Headed and S4S to 1 5-16"x1 5-16"			2,000
1"x3"—2' Pickets, Headed and S4S to ¾"x2½"			850
1"x3"—3' Pickets, Headed and S4S to ¾"x2½"			1,275
1"x3"—4' Pickets, Headed and S4S to ¾"x2½"			1,700
O. G. Battens, 2"			300
O. G. Battens, 2½"			350
O. G. Battens, 3"			400
⅜"x3" Battens S1S			300
1¼"x1¼"x18" Squares (add 60 lbs. for each 2" over 18") per M pieces			600
1½"x1½"x18" Squares (add 95 lbs. for each 2" over 18") per M pieces			850

2"x2"x18" Squares (add 165 lbs. for each 2" over 18") per M pieces 1,500

CLASSIFICATION AND INSPECTION

For

BAY POPLAR (TUPELO) LUMBER

Adopted June 28, 1906.
Amended November 16, 1910

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Southern Cypress Manufacturers' Association

General Explanations

All tapering boards shall be measured at one-third the distance from the narrow end.

Lumber shall be manufactured and shipped in standard lengths and thicknesses.

All lumber shipped in the rough shall be of sufficient thickness to S1S or S2S to the same standard thicknesses as cypress.

The standard finished sizes shall be the same as those of cypress.

Scant sawed lumber shall be reduced to the next standard thickness.

All random standard length stock may be furnished in odd as well as even foot lengths, but there shall not be to exceed twenty per cent. of odd lengths in any one item.

Wagon box boards shall be 12, 14 and 16 feet.

1st and 2nd clear shall be 10 to 20 feet.

No. 1 common or shop shall be 6 feet and longer.

No. 1 boxing shall be 4 feet and longer.

No. 2 boxing shall be 4 feet and longer.

Flooring, ceiling, partition, bevel and drop siding and wainscoting shall be 10 to 20 feet.

Casing, base and mouldings shall be 6 to 20 feet in both odd and even foot lengths, but not exceeding 10 per cent. of 6, 7, 8 and 9 foot lengths.

All lumber less than one inch in thickness shall be measured face measure.

Bright sap in bay poplar is not to be considered a defect, and sap shall be considered bright which will show bright when planed once.

Ordinary season checks are not to be considered defects.

Clear face cuttings must show one face clear of all defects except bright sap, except as hereinafter stated. The reverse side of clear face cuttings may contain small defects or one large defect not exceeding 2" in diameter that will not materially weaken the strength of the piece, and that will not show through to the face when worked.

Standard Defects

One knot 1¼ inches in diameter. Two knots not exceeding in extent one standard knot.

Worm holes, grub holes, or rafting pin holes not exceeding in extent or damage one standard knot.

One bark edge or wane not to exceed one inch in the aggregate, running not to exceed one-third the length of the board and showing on one edge only, said wane to be measured.

Splits that do not diverge more than one inch for each foot in length are straight splits.

Wide pieces of lumber that would take two or three standard defects may have one large defect equal in damage to three standard defects.

Standard Grades

All standard grades of bay poplar shall be classified for the purpose of inspection, as follows:

Wagon Box boards, first and second clear, No. 1 common or shop, No. 1 boxing, No. 2 boxing.

Wagon Box Boards

Lengths, 12, 14 and 16 feet.
Widths, 8 to 12 inches, and 13 to 17 inches.
Thickness, one inch.

In WAGON BOX BOARDS bright sap or slightly discolored sap that will dress up sound, not necessarily bright but not black, admitted.

One sound knot not to exceed one inch in diameter, showing on one side only, will be admitted in this grade.

Splits in 12 foot may be fifteen inches long, or any defect that will cut off leaving the board 10 feet 6 inches long. 14 foot is used for making one side 10 feet 6 inches, and one end 3 feet 6 inches, so a split is a serious defect in this length; but ten per cent of all 14 foot in a given lot may have one split not to exceed 12 inches in length. 16 foot may have any defects, showing through the piece, provided it will cut two pieces same as a 14-foot board.

First and Second Clear

Shall be six inches and over in width, 10 to 20 feet in length; pieces six inches to eight inches wide shall be clear. Pieces nine inches to 10 inches wide shall admit one standard defect or its equivalent; pieces 11 inches to 12 inches wide shall admit two standard defects or their equivalent; for each additional two inches in width over 12 inches, an additional standard defect or its equivalent shall be admitted. In this grade straight splits shall be admitted which do not exceed in length the width of the piece in inches. Slightly discolored sap which will dress up sound, not necessarily bright, but not black, shall be admitted.

No. 1 Common or Shop

Lengths 6 to 20 feet, not to exceed 10% of 6 foot lengths; widths 4 inches and over. This grade must work 66 2-3% or better clear face cuttings. Smallest cutting allowed must contain 144 square inches and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 1 Boxing

Lengths 4 to 20 feet, widths 4 inches and wider. Will admit of knots, stains, worm holes, shake, wane and other defects, the same, however, to cut 75% or better for ordinary box making or crating purposes.

No. 2 Boxing

Shall be 3 inches and over in width, 4 feet and over in length, and shall admit all pieces below the grade of No. 1 boxing which will work at least one-half for ordinary box-making purposes. Stain, worm holes, warped and woolly pieces belong in this grade.

Car Siding Strips

Shall be specified lengths, one inch thick and six inches wide, and shall have one clear face.

Bevel Siding

B and Better Grade. Shall admit slightly discolored sap, or three sound knots, not to exceed three-quarters of an inch in diameter or their equivalent.

C Grade. Shall comprise stock not up to grade of B, admitting unsound knots, splits, etc., provided three-fourths of the piece will work merchantable.

Drop Siding

C and Better Grade. Shall admit of discolored sap, two standard knots, or their equivalent in small knots or other defects, provided the piece will work 75 per cent. without waste.

Flooring and Ceiling

B and Better Grade. Shall admit of one standard knot or three small knots and slights sap stains.

C Grade. Shall comprise stock not up to grade of B, provided three-fourths of the piece will work merchantable.

Four and six-inch flooring and ceiling shall be worked 3¼ and 5¼ inch face.

Partition

B and Better Grade. Will be graded the same as B and better flooring on both sides.

Wainscoting

Shall be graded the same as flooring and ceiling.

Casing, Base and Mouldings

Shall be based on Universal Moulding Book.

Weights of Bay Poplar (Tupelo).

	Pounds per M.		
	Green	Rough Dry	S1S or S2S Dry
Lumber 2½" and 3"	5,000	3,500	2,900
Lumber 2"	5,000	3,200	2,600
Lumber, 1½", 1¼" and 1"	5,000	3,000	2,400
1" Lumber, Rough, Resawed		2,800	
1" Lumber, Rough, Resawed twice		2,700	
1" Lumber, S2S and resawed			2,250
1" Lumber, Resawed and S2S afterwards			2,000
2" Lumber, Rough, Resawed twice		2,800	
Lath ⅜"		500	
⅜" Panel Stock			1,100
½" Panel Stock			1,400
⅝" Panel Stock			1,700
¾" Panel Stock			2,200
13/16" Flooring, Partition, Drop Siding Shiplap Moulded Casing and Base			2,200
⅝" Ceiling			1,600
½" Ceiling			1,300
⅜" Ceiling			1,000
½" Bevel Siding			1,000

CODE OF ETHICS

Adopted at St. Louis, Mo., May 23, 1911.

BY THE

AMERICAN LUMBER TRADES CONGRESS

(A Convention of Thirty Retail, Manufacturing and Wholesale Lumber Associations.)

Preamble

The object of this organization shall be to formulate and recommend a statement of the ethical relations which should govern between the buyers and sellers of lumber and its products. Nothing in the code of ethics should, in any way, interfere with the right of buyer and seller to make contracts on any terms that they see fit.

Order Methods

1. (a) All orders taken by personal solicitation should be in writing, and should be signed or acknowledged by both the buyer and the seller or by the authorized agent of each.

(b) All oral or telephone orders or conversations relative to such orders should be promptly acknowledged or confirmed in writing; otherwise there will be no evidence to hold either party.

(c) With mail or telegraph orders, the original orders received from a buyer should be considered the contract, and all settlements should be made upon the basis of the same, unless the buyer permits the seller to make certain changes, which may be requested in acknowledging the order. If shipment is made before the buyer grants such permission, or is able to instruct the mills, settlement should be made on the basis of the buyer's original order or such amendments as may have been made.

(d) Any changes or additions should be agreed to by both buyer and seller.

Order Specifications

2. All orders should be complete and explicit and should specify the grades, terms and conditions of sale.

3. The latest grade names adopted by the different lumber associations should always be used in writing up each and every order or contract. Where the latest grade names are not used, or improper abbreviations are used, or any omissions cause a misunderstanding resulting in loss, it should be held that the party first writing up the order should be responsible and should sustain any loss incurred by reason of such errors or omissions.

Order Acknowledgment

4. An order or contract should be considered binding when same has been duly signed by both buyer and seller or legally authorized agents of either party or has been acknowledged by the seller. (The man who is the exclusive recognized salaried salesman for a wholesaler or manufacturer should be considered their "authorized" agent, and a salaried employee holding a position of responsibility should be considered the authorized agent of the buyer.) Such acknowledgment should be sent to buyer immediately upon receipt of order and in due course of mail. Failure to send such acknowledgment should release the buyer from his order obligations.

5. No commission man, unless specially authorized, should be regarded as having the authority to bind any seller on orders taken by him, and all such orders should not be regarded as binding upon the sellers until the same have been acknowledged by them as duly accepted.

6. The terms of sale, as noted on original order or acceptance of same should be considered as much a part of the contract as the price at which the stock is purchased.

Should any shipment upon which cash has been advanced or discount has been taken, on arrival at destination, not be acceptable, for legitimate reasons, to buyers, or satisfactory adjustment can not be made as to the acceptance of the stock, buyer should have the right to demand return of such money as he has paid, before allowing the shipment to be moved or disposed of elsewhere.

Delay By Carriers

7. The seller should not be responsible for delays incident to transportation beyond his control, unless otherwise specifically agreed.

Definite Time for Shipment

8. When definite time for shipment is specified, failure to ship within said time should permit the buyer to cancel the order by wire.

9. Where definite date for shipment is not specified on the order, the buyer should

not be entitled to cancel such order inside of thirty days from date of the order without the consent of the seller. Whenever shipments are not made within thirty days, the seller should forthwith notify the buyer, giving reasons for failure to ship. Buyer should then (or at any time within an additional thirty days) have the privilege of forthwith canceling by wire. Should he fail to so cancel, the seller should have an additional thirty days in which to ship. In the event of the seller's failure to so ship within the additional thirty days (and in the event the buyer has not received any additional information as to the shipment within this additional thirty days or ten days thereafter) the buyer should have the privilege of buying on the open market, and if the price shall have advanced, the seller should reimburse the buyer to the extent of such advance. Otherwise the order should remain in effect until canceled.

10. No order should be canceled after the same is loaded on the car; provided, however, that it has been filled in accordance with the contract between buyer and seller, except as to date of shipment. A copy of bill of lading or equivalent evidence, showing date of shipment, should be forwarded with invoice.

Special and Worked Stock.

11. The seller should be protected in all cases where special stock has been manufactured or worked to apply on the order, providing the buyer is forthwith notified what such charge or loss will be on the part of the seller, if not allowed to ship out such portions as may have been worked to apply on the order, with the further understanding that shipment can be made with three days' grace, but the buyer should not be bound to accept the shipment if it cannot be loaded within the three days, regardless of the circumstances which may prevent the seller from so doing, except under car shortage conditions, when ten days' grace should apply.

Credit Rating

12. Unless the buyer is rated and in good standing, as shown by the well-known lumber credit agencies, no order should be binding upon a seller until such credit and good standing shall have been satisfactorily proved to the seller. Such investigation should be completed within a reasonable time.

Transit and Storage Shipments

13. Transit and storage shipments should be subject to the rules applying to direct shipments, except as otherwise stated and agreed to at the time of giving and accepting the order. Invoices for transit cars should bear the date of diversion. Where a specific carload is ordered, no other car should be substituted without consent of the buyer. It should be the duty of the seller to advise the buyer at the time the order for the transit car is accepted as to whether shipment is actually in transit or in storage at some intermediate point between original shipping point and ultimate destination, and to give the purchaser all the information in his possession regarding the present location and movement of the shipment in order to avoid misunderstanding.

Arbitration

14. Except when inspection is provided for by association inspection bureaus, claims on grades, also differences regarding contracts, should be settled by arbitration on request of the parties interested.

Whenever a case for arbitration arises, one referee should be appointed by the retailers' association in which territory the claimant resides, and a second referee should be appointed by the manufacturers' or the wholesalers' association covering the district in which the shipment originated. Said referee, as appointed, should, before consideration of the case is entered into, appoint a third referee, and all referees should be appointed with due consideration to convenience and expense. The expense of such arbitration should be paid pro rata, as the fault may appear.

Arbitration methods should be employed wherever possible in the settlement of all matters in dispute.

A written statement of the findings in each case should be made by the referees, and their findings should be final and copies should be sent to the secretaries of each of the organizations through which the referees were appointed.

15. In the matter of costs of inspections made by association inspection bureaus on lumber, the grade of measurement of which has been complained of, if reinspection or measurement shows the grade of the total amount of the item complained of to be within 5 per cent. of the grade invoiced or within 1 per cent. of the quantity invoiced, the expense should be borne by complainant; if otherwise, by the shipper. The shipper must credit buyer with the amount of

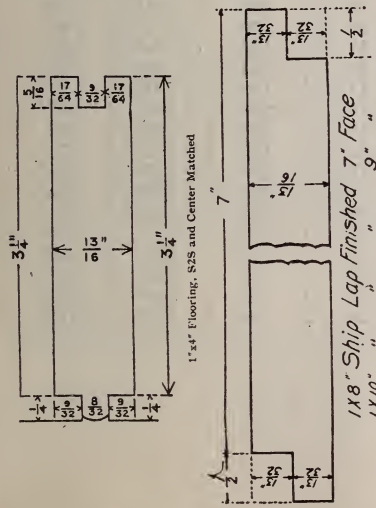
degrade found by inspection, irrespective of percent determined between the grade sold and the grade shipped, at an equitable price. No claim on grade or measurement should be considered valid unless made by final consignee within five days after unloading the car.

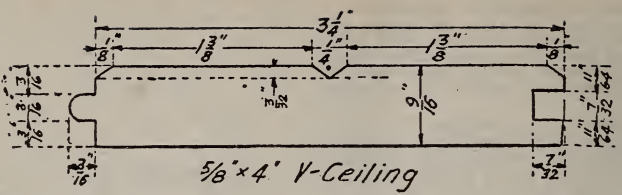
16. It should be recognized by lumber manufacturers and wholesalers that the retail distributer of lumber is a necessary factor in the trade, and a useful servant to the public, and, as such, should be recognized as the logical channel through whom to market their products.

17. It is the sense of the congress that this code of ethics should apply to all forest products handled by lumbermen.

TERMS OF SALE.

The consignee shall pay freight, balance net cash, 60 days from date of invoice. Discount (a premium offered for prompt remittance) will be allowed on the amount remitted only, as follows: 2% within 15 days or 1% within 30 days from date of invoice.


1"x4" Flooring, S2S and Center Matched
1x8" Ship Lap Finished 7" Face
1x10" " " " 9" " "
1x12" " " " 11" " "
1x12 in. Grooved Roofing. This Pattern run 1x10 if desired.
5/8"x4" Beaded Ceiling



5/8"×4" V-Ceiling

Percentage table for figuring percentages of cutting lumber.

Table of Square Inches of Boards Containing 5 feet or more.

Ft.	100%	60%	40%
4	576	346	230
5	720	432	288
6	864	518	346
7	1008	605	403
8	1152	691	461
9	1296	778	518
10	1440	864	576
11	1584	950	634
12	1728	1037	691
13	1872	1123	749
14	2016	1210	806
15	2160	1296	864
16	2304	1382	922
17	2448	1469	979
18	2592	1555	1037
19	2736	1642	1094
20	2880	1728	1152
21	3024	1814	1210
22	3168	1901	1267
23	3312	1987	1325
24	3456	2074	1382
25	3600	2160	1440
26	3744	2246	1498
27	3888	2333	1555
28	4032	2419	1613
29	4176	2506	1670
30	4320	2592	1728

Percentage table for figuring percentages of cutting lumber.

Percentage of 60 and 40% of 8 feet and longer boards in lineal inches.

Length	100%	60%	40%
8	96	57^{6}	38^{4}
9	108	64^{8}	43^{2}
10	120	72	48
11	132	79^{2}	52^{8}
12	144	86^{4}	57^{6}
13	156	93^{6}	62^{4}
14	168	100^{8}	67^{2}
15	180	108	72
16	192	115^{2}	76^{8}
17	204	122^{4}	81^{6}
18	216	129^{6}	86^{4}
19	228	136^{8}	91^{2}
20	240	144	96
21	252	151^{2}	100^{8}
22	264	158^{4}	105^{6}
23	276	165^{6}	110^{4}
24	288	172^{8}	115^{2}

Percentage table for figuring percentages of cutting lumber.

Percentage of 2 inch and wider rips on boards of 5 inches and wider.

Width	Rip 2 in.	Rip 2½ in.	Rip 3 in.	Rip 3½ in.	Rip 4 in.	Rip 4½ in.	Rip 5 in.	Rip 5½ in.	Rip 6 in.	Rip 6½ in.	Rip 7 in.
5	40%	50%	60%								
6	$33\frac{1}{3}$	$41\frac{2}{3}$	50	$58\frac{1}{3}$	$66\frac{2}{3}$						
7	$28\frac{4}{7}$	$35\frac{5}{7}$	$42\frac{6}{7}$	50	$57\frac{1}{7}$	$64\frac{2}{7}$					
8	25	$31\frac{1}{4}$	$37\frac{1}{2}$	$43\frac{3}{4}$	50	$56\frac{1}{4}$	$62\frac{1}{2}$				
9	$22\frac{2}{9}$	$27\frac{7}{9}$	$33\frac{1}{3}$	$38\frac{8}{9}$	$44\frac{4}{9}$	50	$55\frac{5}{9}$				
10	20	25	30	35	40	45	50	55	60		
11	$18\frac{2}{11}$	$22\frac{8}{11}$	$27\frac{3}{11}$	$31\frac{9}{11}$	$36\frac{4}{11}$	$40\frac{10}{11}$	$45\frac{5}{11}$	50	$54\frac{6}{11}$	$59\frac{1}{11}$	
12	$16\frac{2}{3}$	$20\frac{5}{6}$	25	$29\frac{1}{6}$	$33\frac{1}{3}$	$37\frac{1}{2}$	$41\frac{2}{3}$	$45\frac{5}{6}$	50	$54\frac{1}{6}$	$58\frac{1}{3}$
13	$15\frac{5}{13}$	$19\frac{3}{13}$	$23\frac{1}{13}$	$26\frac{12}{13}$	$30\frac{10}{13}$	$34\frac{8}{13}$	$38\frac{6}{13}$	$42\frac{4}{13}$	$46\frac{2}{13}$	50	$53\frac{11}{13}$
14	$14\frac{2}{7}$	$17\frac{5}{7}$	$21\frac{3}{7}$	25	$28\frac{4}{7}$	$32\frac{1}{7}$	$35\frac{5}{7}$	$39\frac{2}{7}$	$42\frac{6}{7}$	$46\frac{3}{7}$	50
15	$13\frac{1}{3}$	$16\frac{2}{3}$	20	$23\frac{1}{3}$	$26\frac{2}{3}$	30	$33\frac{1}{3}$	$36\frac{2}{3}$	40	$43\frac{1}{3}$	$46\frac{2}{3}$
16	$12\frac{1}{2}$	$15\frac{5}{8}$	$18\frac{3}{4}$	$21\frac{7}{8}$	25	$28\frac{1}{8}$	$31\frac{1}{4}$	$34\frac{3}{8}$	$37\frac{1}{2}$	$40\frac{5}{8}$	$43\frac{3}{4}$
17	$11\frac{13}{17}$	$14\frac{12}{17}$	$17\frac{11}{17}$	$20\frac{10}{17}$	$23\frac{9}{17}$	$26\frac{8}{17}$	$29\frac{7}{17}$	$32\frac{6}{17}$	$35\frac{5}{17}$	$38\frac{4}{17}$	$41\frac{3}{17}$
18	$11\frac{1}{9}$	$13\frac{8}{9}$	$16\frac{2}{3}$	$19\frac{4}{9}$	$22\frac{2}{9}$	25	$27\frac{7}{9}$	$30\frac{5}{9}$	$33\frac{1}{3}$	$36\frac{1}{9}$	$38\frac{8}{9}$

ASSOCIATION STANDARD GRADES

RULES FOR THE GRADING
of
NORTHERN PINE
SPRUCE AND TAMARACK
LUMBER

Reported by the
BUREAU OF GRADES
And Adopted by the
Northern Pine Manufacturers' Association

PREFACE.

The accompanying rules were adopted by the Bureau of Grades of the Mississippi Valley Lumbermen's Association and the Wisconsin Valley Lumbermen's Association in the fall of 1894, and have since been in force. In 1906 these two associations were merged into the organization called the Northern Pine Manufacturers' Association. Since that time there has been a constantly increasing demand for them, not only from persons in the lumber business, but from those in other lines who consume large amounts of lumber.

The Army and Navy Departments of the United States recognize these rules as the basis for grading White and Norway Pine, and the Bureau of Grades is receiving requests for them from the chiefs of army construction boards and navy yards.

Requests from lumber dealers and others interested in Pine grades in foreign countries are being steadily received, and these rules are generally recognized as the standard for White and Norway Pine.

Seven editions have been issued. Only slight changes have been made, and these have been suggested by the experience of the intervening period during which the work of unifying the grading of White and Norway Pine lumber has been carried on under the auspices of the organization mentioned. The rules express, as nearly as it is possible to define them, the grades of lumber being made under the supervision of the Bureau of Grades with its corps of inspectors. Ninety-five per cent of all the White and Norway Pine lumber made in the region west of and including the Wisconsin Valley in Wisconsin and in the Mississippi Valley between Minnesota and Missouri, is graded in accordance with these rules, and is subjected to the supervisory inspection of the employes of the Bureau of Grades.

GRADES AND NOMENCLATURE

The following are the standard grades adopted and the terms by which they are to be known:

Thick Finishing.

1st, 2d and 3d Clear, 1¼, 1½ and 2-inch.
A Select, 1¼, 1½ and 2-inch.
B Select, 1¼, 1½ and 2-inch.
C Select, 1¼, 1½ and 2-inch.
D Select, 1¼, 1½ and 2-inch.

Inch Finishing.

1st, 2d and 3d Clear.
A Select.
B Select.
C Select.
D Select.
D Stock.

Siding.

A and Clear.
B
C
D
E

Flooring.

A Flooring.
B Flooring.
C Flooring.
D Flooring.
Farmers Clear Flooring.
No. 1 Fencing, D. & M.
No. 2 Fencing, D. & M.
No. 3 Fencing, D. & M.

Ship Lap, Grooved Roofing and D. & M.

No. 1.
No. 2.
No. 3.

Factory Plank or Shop Common.

No. 1 Shop.
No. 2 Shop.
No. 3 Shop.
Inch Shop.
Short Box.

Factory Selects.

Factory A Select and Better.
Factory B Select.
Factory C Select.

Thick Common Lumber.

Tank Stock.
Select Common.
No. 1 Common.
No. 2 Common.
No. 3 Common.
No. 4 Common.
No. 5 Common.

Common Boards.

No. 1.
No. 2.
No. 3.
No. 4.
No. 5.

Fencing.

No. 1.
No. 2.
No. 3.
No. 4.

Dimension.

No. 1.
No. 2.
No. 3.

Lath.

No. 1.
No. 2.

RULES FOR GRADING NORTHERN PINE, SPRUCE AND TAMARACK LUMBER.

General Instructions.

The aim of the uniform grading inspection is to harmonize the natural differences which exist in the characteristics of the different stocks co-operating in this bureau, making lumber of the same grades, at the different manufacturing points, of practically equal value, whether the logs from which the lumber is cut are large or small, coarse-knotted, fine-knotted, black-knotted, red-knotted, sound or shaky.

1. No arbitrary rules for the inspection of lumber can be maintained with satisfaction. The variations from any given rule are numerous and suggested by practical common sense, so nothing more definite than the general features of different grades should be attempted by rules of inspection. The following, therefore, are submitted as the general characteristics of the different grades.

2. In the grading of finishing lumber in common practice, there is a recognized difference in classifying inch lumber, and lumber thicker than inch.

3. A very large percentage of the one and one-fourth, one and one-half and two-inch lumber used for finishing purposes goes into work requiring each face to be shown, as in doors, sash, etc. With inch lumber, except shop common and partition, the uses are quite different, the almost invariable practice being that one face of the board is shown and that face the better one.

4. The face side of the lumber is the side showing the best quality or appearance.

5. Defects in lumber should be distributed in proportion to the size of the piece. Long or wide pieces of the same grade may contain more and greater defects than shorter or narrower pieces. The same percentage should be observed in both long and short, wide and narrow.

6. Wane in lumber is a defect which cannot be described by rule with satisfaction, and therefore must be left to the judgment of the grader.

7. In a general way, D. & M. stock, except No. 3, should have a good bearing on back, and lumber S. 1 S. or S. 2 S. shows nearly a full face.

8. The lowering of grade on the face side on account of wane, should be governed by grade, width and defects in the piece.

9. Due consideration in rough stock should be given for the amount of wane that would be surfaced off in milling.

10. Lumber must be accepted on grade in the form in which it was shipped. Any subsequent change in manufacture or mill work will prohibit an inspection for the adjustment of claims, except with the consent of all parties interested.

11. Mixed widths boards do not necessarily require as good edges as shiplap or dressed and matched stock of the same grade.

12. Planing mill work should be taken into consideration in all grades of dressed lumber, and its effect on a piece must be left largely to the judgment of the inspector.

13. Thick C Select, except for factory purposes, should be graded on its best side or face, not so much attention being given to the back; but in the grades of B Select and Better, the backs should, as a rule, be within one grade of the face.

14. The grade of partition shall be determined from its poorer side.

15. Lumber when worked shall be graded the same as the respective grades when in the rough.

16. Unless otherwise provided for, lumber worked two sides shall be graded from its better side or face; lumber worked one side shall be graded from its surfaced face.

17. The examples given in this book do not in all cases include all of the different types in any grade.

18. The interpretation of any grade is intended to cover all lumber between the next higher grade above, and the next grade below.

19. It is not contemplated by these rules to cover car siding and roofing, the grades of which should be determined by special agreement.

ASSOCIATION STANDARD GRADES.

FINISHING.

Clears.

First Clear.—This should be twelve inches or wider and free from all defects.

Second Clear.—This should be ten inches or wider. When ten inches wide it should be free from all defects. A twelve-inch board must have a perfect face. A half-inch of white sap on each edge, or one inch of sap on one edge of back is allowed. In the absence of sap one or two small pin knots not to exceed one-half inch in diameter are admissible. Pieces wider than twelve inches must have a perfect face but can have sap or knot defects proportionately greater as the piece is wider.

Third Clear.—This should be eight inches or wider. A piece eight inches wide should be free from all defects on both sides. In a ten-inch piece one or two small knots, not to exceed one-half inch in diameter, or in the absence of knots, white sap not to exceed one-half inch in width on each edge, or one inch in width on one edge, is admissible. A piece from twelve inches to fourteen inches wide may have one inch of white sap on each edge of face or more sap on one edge. In the absence of sap or with less sap one or two small knots an inch in diameter are admissible. Wider stock can have more sap or slightly larger knots. The reverse side of Third Clear ten inches and wider, should not show poorer in quality than "A" Select face.

See General Instructions.

EXAMPLES.

Example 1. Piece 1x14-16. Face side has a black knot on edge one and one-fourth by one inch, two feet from end but not showing through. One small black knot one-half inch in diameter one foot from end, balance of face side clear. Reverse side shows one inch of white sap for six feet on one edge and about one foot slightly discolored sap.

Example 2. Piece 1x18-16. Face side shows two half-inch black knots and two small pin knots near one end, also a half-inch black knot near center. Reverse side shows practically the same defects except the knots are slightly larger.

Example 3. Piece 1x16-16. Shows an inch and a half of white sap for eight feet on one edge of the face side; no other defects. Reverse side shows three inches of white sap for twelve feet on one edge; no other defects.

Example 4. Piece 1x12-14. Face side shows one and one-half inches white sap on each edge for four feet at one end. One small knot one-half inch in diameter near other end. Reverse side shows three inches of white sap for twelve feet on one edge and two inches of white sap on other edge, full length of the piece, and two small knots one-half inch in diameter.

Example 5. Piece 1x10-16. Has a clear face. Reverse side has one inch of slightly stained sap for two feet on one edge; otherwise perfect.

Example 6. Piece 1x8-16. This piece is free from all defects on both sides.

"A" SELECT.

1. "A" Select should be eight inches or wider. On the face side an eight-inch piece should be nearly perfect. An inch of white sap on one edge or one or two sound knots not to exceed one-half inch in diameter are admissible.

2. A ten-inch piece will admit of an inch and a half of white sap full length of one edge or less sap on both edges of face with no other defects, or will admit of two or three knots one-half inch in diameter if well scattered, or one or two knots not over an inch in diameter if well located.

3. Pieces fourteen inches and wider will admit of proportionately greater sap and knot defects as width increases, or very slight local shake, or a straight split for six or eight inches, or one or two large worm holes near end or edge.

See General Instructions.

EXAMPLES.

Example 1. Piece 1x8-16. Shows one-alf inch of white sap on one edge full ngth of the piece, and one small knot ie-half inch in diameter.

Example 2. Piece 1x10-16. The face side as a quarter-inch of slightly colored sap r one foot, otherwise perfect. Reverse de shows a little sap slightly blue on two ges.

Example 3. Piece 1x10-16. Is perfect on oth sides, except a slight local shake in ie spot.

Example 4. Piece 1x10-16. Very smooth appearance with one knot three-quarters an inch two feet from one end. An-her smaller knot near other end, also one ch of white sap two feet in length at one id and one-half inch of sap on opposite ge of other end.

Example 5. Piece 1x12-16. On face side as one knot one and one-half inches in ameter and one pin knot, both going rough the board; otherwise perfect.

Example 6. Piece 1x12-16. Has two ree-fourth-inch knots that go through the oard and an inch of white sap on one ge full length of piece.

Example 7. Piece 1x14-16. Face side ows one small knot a half-inch in ameter. A half-inch of stained sap for vo feet on one edge at center of board. everse side at center has two inches of ained sap on one edge for five feet and her edge has one inch of stained sap r four feet. This is considered a high pe of "A" Select.

Example 8. Piece 1x16-16. Face side ows two black knots, one inch in diameter ear one end and three small pin knots. everse side shows two knots one inch in ameter at one end. On one edge three ches of white sap for ten feet. Other dge has two inches of slightly colored sap r eight feet.

Example 9. Piece 1¼x16-16. One face as two inches of sap full length of one dge, discolored in streaks. Reverse side ows three-fourths inch wane for three ches, and three inches slightly colored p full length of one edge.

Example 10. Piece 1¼x19-16. Face shows five-eighths inch black knot one foot om end. At same end on opposite cor-er a check eight inches long. At the ther end is a slight shake for ten inches center; also at the left from same end ear edge, a pitch pocket one and one-ourth inches long. No sap on face. Re-erse side shows one-fourth to three-fourths ch worm eaten sap for eight feet on one dge. The small black knot at end shows hrough from face side.

"B" SELECT.

1. "B" Select may be 4 inches or wider.

2. In this grade white sap is not considered a defect unless too many other imperfections appear.

3. Knots, shake, season checks and a small amount of stained sap are admissible.

4. A 4-inch or 6-inch piece should have but very little shake. Wider pieces can have more shake, but it should be local and not scattered over the face of the piece.

5. Season checks equivalent to shake defects are admissible.

6. Slightly stained sap is admissible when other defects are not of a serious nature, the amount of stained sap depending upon width of piece.

See General Instructions.

EXAMPLES.

Example 1. Piece 1x8-16. Has two inches of bright white sap the entire length of piece on one edge. The other edge has two inches of bright white sap for three-quarters its length. The balance of that edge is discolored sap. Other end of piece has one small knot.

Example 2. Piece 1x8-16. Three-quarters of the entire face shows white sap and a small knot at one end.

Example 3. Piece 1x10-16. Has one inch of stained sap for one-third the length of the piece. One small knot at each end and one five-eighths knot near center of board.

Example 4. Piece 1x10-16. Has local shake near one end and one and one-half inch bright sap on both edges with small knot at end.

Example 5. Piece 1x12-16. Has a small knot at each end, two and a half inches of slightly stained sap for four feet on one edge, and an inch and a half of white sap on the other end of opposite edge. The reverse side has three inches of stained sap on both edges for five feet at one end.

Example 6. Piece 1x12-12. Shows one and one-half inches white sap on one edge for half length of piece; other edge shows two inches of white sap two-thirds of length. Scattered over the face of this board are six small knots varying in size from an inch to a small pin knot.

Example 7. Piece 1x12-16. Both edges of this board have sap varying in width from two to three inches and running full length of the piece, the sap showing slight discolorations. No knot defects or shake are shown.

Example 8. Piece 1x20-16. Has a rot stain three inches wide and eight inches long at one end, one three-quarter inch unsound knot at other end and two half-inch knots. The reverse side has same appearance, except a narrow streak of white sap and half-inch of stained sap for four feet.

Example 9. Piece 1x14-16. Has three half-inch black knots, one and one-half inches of bright sap for eight feet on edge and two and one-half inches of bright sap for four feet on other edge. The reverse side has three inches of bright sap on both edges for three feet and three-quarter inches of wane for three feet and shows same knots as on face.

Example 10. Piece 2x12-16. Has one poor knot three-quarter inches in diameter, but otherwise face is perfect. The reverse side shows stained sap on both edges three inches wide for four feet and one-half inch of wane for eight feet.

Example 11. Piece 2x14-16. At one end near the edge has one and one-half inch knot; at the other end shake five inches wide for three feet on the same edge as knot. Reverse side shows three inches of slightly stained sap for eight feet.

Example 12. Piece 1x18-16. At one end shows shell shake for two feet running across one-half of the face. One edge shows three inches of slightly stained sap for eight feet. This piece also has three small knots not over one-half inch in diameter scattered over the face.

Example 13. Piece 1¼x14-16. Face side shows two inches of slightly colored sap at one end, running out at four feet, but no other imperfections. Reverse side shows sap over two-thirds of the piece, slightly colored in spots for six feet. No knots in this piece.

Example 14. Piece 1¼x16-16. Face side shows five black knots well scattered from one-half to one inch in diameter. Also three-fourths inch slightly stained sap at one end running out at six feet.

Example 15. Piece 1x12-16. The face shows two-thirds white sap; no other defects except that one edge shows fifteen inches wane on the back side one inch wide, but not to a feather edge on the face side.

Example 16. Piece 1x10-16. Shows four inches white sap the entire length on one edge. No other defects except wane on the back for eighteen inches.

"C" SELECT.

1. "C" Select may be 4 inches or wider.
2. This grade will admit of quite serious defects if the piece retains at the same time a fair appearance.
3. The defects admissible are the same as those in "B" Select, but exist to a greater degree.
4. Medium blue stain covering one-third the face of the piece or surface season checks equivalent to shake defect are admissible if not in combination with other marked defects.

See General Instructions.

EXAMPLES.

Example 1. Piece 1x8-16. Shows three inches of stained sap for two feet and three small knots. The reverse side has stained sap in four places.

Example 2. Piece 1x8-16. Has an inch and a half of white sap on each edge full length of piece and eight small knots well scattered.

Example 3. Piece 1x8-16. Shows three feet of tight shake on one edge at one end and one foot of open shake on the other end; otherwise of good appearance.

Example 4. Piece 1x10-16. Has white sap on the face side, no knots, but three feet of shake in center of board about three feet from one end. Board has a smooth appearance.

Example 5. Piece 1x10-16. Has five very small knots well scattered, a streak of stained sap on one edge and an inch of stained sap for two feet on the end of other edge.

Example 6. Piece 1x10-16. The face is free from defect except two and a half inches of stained sap for eight feet on one edge; otherwise very smooth in appearance. The reverse side shows quite an amount of stained sap.

Example 7. Piece 1x12-16. Has two inches of stained sap on each edge, two one-inch knots and two one-half inch knots. One quarter of one side shows sap clear across, slightly stained.

Example 8. Piece 1x12-16. Has a very smooth appearance, but shows shake clear through for three feet at one end and four small knots.

Example 9. Piece 1x12-16. Shows considerable white sap on each edge, with eight small knots ranging from a pin knot to one inch in diameter.

Example 10. Piece 1x12-16. Quite smooth in appearance with shake four inches wide tapering off at one-third length of the piece. At other end of the piece, shake running in "V" shape for 18 inches.

Example 11. Piece 1x14-16. Has two inches of stained sap for four and one-half feet in center on one edge and a streak of stained sap at both ends of other edge. The reverse side shows one pitch spot 2x3 inches and three inches stained sap, same as in center of the other side. Two or three inches of white sap on each edge of both ends.

Example 12. Piece 1x14-16. Has one three-fourth-inch poor knot and three one-half-inch black knots, also four feet of tight shake at one end. Reverse side shows same knot and shake defects with three inches of white sap for two feet.

Example 13. Piece 1x18-16. At first appearance this board seems to be clear, but on closer examination a great deal of close, tight shake is found to be scattered over at least one-half of the face. The shake, however, is very fine and tight.

Example 14. Piece 1x16-16. Has the appearance of an extra sound "D" Box. The knots are smaller and in general appearance much above the average "D" Box grade. The sap is white and there are ten small knots, three of which are one inch in diameter, and the remainder from one-half inch down to a pin knot.

Example 15. Piece 1x13-14. Within one foot of end is one and one-fourth-inch sound black knot; also a one-fourth-inch black knot, and scattered over the face are two one-half inch and two pin knots with three inches of bright sap on one edge, running off at nine feet.

Example 16. Piece 1¼x12-16. Face has slightly colored sap two inches wide on one edge for ten feet; other edge has same amount and kind of sap for two feet, but no other imperfections. Reverse side shows slightly colored sap over the full width for eight feet in length.

Example 17. Piece 1½x20-16. Face side shows worm holes 16 inches from end in center; one three-fourths-inch black knot three feet from end on one edge; a one-half-inch black knot in center and seven feet from the other end within twelve inches of same end, one red knot three-fourths by one and one-half inches near edge; also three inches of white sap on both edges for twelve feet, with one-half inch wane for eight feet on one edge. Reverse side shows less sap, but same knot defects, except that knots show larger.

Example 18. Piece 1¼x16-16. Has two feet very fine shake across the face at one end, one and one-half inches of it on edge extending for four feet; another trace of shake on edge near opposite end, also one and one-fourth inch soft rotten knot and one and one-fourth inches of dead sap tapering out at four feet.

Example 19. Piece 1½x16-16. Has two feet very fine shake across face on one end, one and one-half inches on one side extending for four feet; another trace of shake on edge near opposite end and on same end one three-fourths-inch soft, rotten knot, and one and three-fourths inches of dead sap, tapering off at four feet. At center of piece are two three-eighths-inch knots. The reverse side shows same rotten knot, and blue sap averaging two and one-half inches in width the whole length of one edge. The other edge has two inches of stained sap for two feet.

Example 20. Piece 1½x18-16. The face has nine black knots from one-fourth to one-half inch in diameter, well scattered, one of the one-half inch knots being unsound. Also contains one and one-half inches of blue sap full length of one edge, and a small amount of shell shake two feet from one end. Reverse side shows five of the one-half inch knots that run through from the face, and three inches of dead sap the entire length of one edge.

Example 21. Piece 1x8-14. Shows fine surface season checks in center of piece for three feet at one end and three small knots well scattered.

Example 22. Piece 1x10-14. Has split on one end twelve inches long and two inches of slightly stained sap for four feet on one edge.

For grade of **Factory Plank**, see shop common and Factory selects.

"D" SELECT.

1. "D" Select may be 4 inches or wider.

2. This grade admits any piece of lumber that has the appearance of finishing or a percentage of cutting in which the defects are too numerous or too serious to admit of its being graded into "C" Select.

3. Medium blue stain covering entire face or season checks equivalent to shake defect will be admitted if not in combination with other marked defects.

Above description embraces one inch or thicker stock and is graded strictly from the face without regard to the back and cannot be recommended for quality.

See General Instructions.

EXAMPLES.

Example 1. 1x10-16. Face shows a great deal of shake for two-thirds of length, and three spots of rough mill work. This piece is smooth in appearance, but extremely shaky.

Example 2. Piece 1x14-16. Very smooth in appearance. No knots, but fine shake over two-thirds of face, with some blue sap on each edge at one end.

Example 3. Piece 1x8-16. Shows blue sap three inches wide on each edge for ten feet; no other imperfections.

Example 4. Piece 1x8-16. Has smooth appearance. Shows partially blue sap over face for six feet; otherwise good.

Example 5. Piece 1x10-16. Shows a "B" Select face, but the reverse side shows the dry rot and worm hole defects of a No. 4 board.

Example 6. Piece 1x8-16. Shows blue sap well streaked over eight feet of the face. The balance of good appearance.

"D" STOCK AND BOX.

1. This is a grade of smooth-looking and sound-knotted lumber with edges free from wane and the grade practically free from shake.

2. The knots may be either black or red, but should be sound and firmly set, varying in size from an inch and a half down.

3. A "D" Box Board may have any number of sound knots, depending entirely upon their size and location.

4. A 12-inch "D" Stock board should contain a less number of knots than a "D" Box, and 8 and 10-inch "D" Stock boards relatively smaller knots and less in number. This grade is nothing more than an extra smooth No. 1 Common.

See General Instructions.

EXAMPLES OF "D" STOCK.

Example 1. Piece 1x12-14. Has three red knots one inch in diameter, ten knots one-half inch in diameter, and ten small pin knots. There is no sap.

Example 2. Piece 1x12-14. Has three knots 1½x¾ inches, part of them red and part black, and six knots 1 inch in diameter, also six small pin knots, red and black mixed.

Example 3. Piece 1x12-16. Has six knots one-half to one inch in diameter and fourteen knots less than one-half inch in diameter, one and one-half inches of sap on one edge for entire length of piece, partly blue. Other edge has one inch partly blue sap. This board is perfectly smooth and sound in appearance.

Example 4. Piece 1x12-16. Has twenty-eight knots, of which six are oblong, one-half by one and one-fourth inches, and eight round red knots one-half to one inch in diameter; the balance are pin knots.

Example 5. Piece 1x10-16. Has twenty sound black knots extending over entire face, that will average less than one inch in diameter. Edges are square and piece is otherwise sound.

Example 6. Piece 1x12-16. Has twenty-five sound knots from one-quarter to one-half inch in diameter, five being red and balance black. Four of the one-half inch red knots at one end are in a cluster. The board is otherwise sound and of good appearance.

Example 7. Piece 1x12-16. Contains twenty-five red and black knots scattered over the face, five being one-half inch in diameter and the others smaller; also has two inches of bright sap full length of one edge and one-half inch bright sap full length of other edge. The board is otherwise perfect.

Example 8. Piece 1x8-16. At one end in a space of three feet there are three black knots, one-half inch in diameter and one black knot three-quarters of an inch in diameter. The center contains two pin knots; at the other end within a space of five feet there are eight sound red knots, two being one inch in diameter, two are one-half inch in diameter and four are pin knots. At a glance this would be considered a fair type of "D" Stock.

Example 9. Piece 1x8-16. There are twenty sound black knots in this piece, none of them exceeding one-half inch in diameter, and all within a space of twelve feet. This is a high grade of "D" Stock.

EXAMPLES OF "D" BOX.

Example 1. Piece 1x18-16. Well scattered over this piece are fifteen round black knots from one-eighth inch to one inch in diameter and at one edge, three feet from end, a cluster of three-quarters inch, sound red knots. An inch of white sap shows along two-thirds of one edge and nearly as much along the other edge.

Example 2. Piece 1x14-16. Has seventeen black knots ranging in size from one inch in diameter down to a pin knot; no other defects. This is considered a high type of "D" Box.

Example 3. Piece 1x14-12. One end has a sound red knot, one by two inches in diameter, and a three-quarter inch red knot within six inches of it. The balance of the face contains eleven small knots well scattered. The piece is otherwise perfect.

Example 4. Piece 1x14-16. Contains eighteen sound knots, three of which are one by one-half inches, five are three-quarters inch and ten are pin knots, all well located.

Example 5. Piece 1x16-14. There are twenty-one sound knots in this piece, eight being black, two of which are one and one-half inches in diameter.

Example 6. Piece 1x16-14. There are twenty-one sound knots in this piece; eight being black, two of which are one and one-half inches in diameter, and the balance three-quarters inch and less. There is also one and one-half inches of bright sap the entire length of one edge.

Example 7. Piece 1x13-16. Has thirteen black and two red knots, all about one-half inch in diameter, well scattered over the face and two inches of bright sap for six feet on one edge.

SIDING.

GENERAL INSTRUCTIONS.

1. Beveled Siding should be graded from the face side only.
2. Defects on the thin edge which will cover when laid should not be given the same consideration as defects elsewhere.

"A" and Clear Siding.

"A" and Clear Siding will admit of bright sap on thin edge which will cover when laid, or a half-inch of bright sap on thick edge for one to two feet, or in the absence of sap one or two pin knots.

EXAMPLES.

Example 1. Piece 5/8x6-16. Shows one-half inch bright sap on thin edge of two-thirds of the length; otherwise perfect.

Example 2. Piece 5/8x6-16. Shows three-fourths inch of bright sap on thin edge for ten feet. One knot one-fourth inch in diameter, three feet from end, and at six inches from other end a slight trace of pitch.

Example 3. Piece 5/8x6-14. For seven feet on thin edge there is one-half inch of sap that is slightly discolored; at the center of the piece is one one-fourth inch black pin knot.

Example 4. Piece 5/8x6-14. On the thin edge there is a one-half inch black knot. Otherwise the piece is perfect.

Example 5. Piece 5/8x6-16. Contains two one-fourth inch black knots, one being three feet from end and the other near the center of the piece; no other defects.

Example 6. Piece 5/8x6-16. This piece is without a defect.

Example 7. Piece 5/8x6-16. Shows no defects except one-quarter inch of white sap on thick edge three feet in length.

Example 8. Piece 5/8x6-16. Shows one pin knot on thick edge less than one-half inch in diameter.

"B" SIDING.

"B" Siding will admit of any amount of white sap, or two or three sound knots not to exceed one-half inch in diameter, well scattered over the face of the piece.

EXAMPLES.

Example 1. Piece 5/8x6-16. Shows a heavy pitch spot one inch long on thin edge, a torn defect on same edge that covers when laid, a pitch pocket one-fourth inch wide by one and one-fourth inches long, two inches from thick edge at the center of the piece, and for six feet on thick edge shows an inch of white sap.

Example 2. Piece 5/8x6-16. Has four very small, smooth knots, one-fourth inch or less in diameter within four feet of end near thin edge, and a one-half inch round red knot within two inches of thick edge and six feet from same end.

Example 3. Piece 5/8x6-16. Has one-half inch white sap the whole length of thick edge and a large curl four feet from one end with one-half inch sound knot.

Example 4. Piece 5/8x6-16. Has a black knot on the thin edge that will cover, a one-half inch black knot one inch from thick edge and two pin knots that show.

Example 5. Piece 5/8x6-16. Shows three-fourths inch of white sap on thick edge, six feet from end; a one-fourth inch black knot at center of piece, and at four feet from other end on thick edge a one-fourth inch black knot.

Example 6. Piece 5/8x6-16. Has a three-fourths inch black knot five feet from one end. The piece is not smoothly dressed, otherwise perfect.

Example 7. Piece 5/8x6-16. Has one-half by three-fourths inch knot on the thick edge, three feet from end, and one-half inch of white sap for two-thirds of length on thick edge.

Example 8. Piece 5/8x6-16. Has two one-half inch black knots within two and one-half feet of one end; another one-half inch knot five feet from same end, all of which show when laid.

Example 9. Piece 5/8x6-16. Has bright sap on thick edge, commencing at one end, one and one-fourth inches deep and running out at twelve feet. With the exception of two curls has no other defects.

Example 10. Piece ⅜x6-16. Has an inch of sap on thick edge for ten feet. For one foot at end this sap is blue. Within three feet of other end is a three-eighths inch black knot.

Example 11. Piece ⅜x6-16. Has white sap covering the entire face; no other defects.

"C" Siding.

1. "C" Siding will admit of any amount of bright sap.
2. Two or three small knots, not exceeding one inch in diameter, or more knots when smaller, or slight shake or season checks are admissible.
3. A small amount of slightly blue sap on the thick edge is admissible, or more blue sap on the thin edge.
4. Defects requiring one cut not to exceed four inches of waste, are allowed in high line pieces twelve feet long and longer.

EXAMPLES.

Example 1. Piece ⅜x6-16. Has a three-fourths inch black knot five feet from one end. A small pitch pocket and a little very tight shake within twelve inches of same end of piece.

Example 2. Piece ⅜x6-16. Has a half-inch black knot on thick edge, five feet from end, and at seven feet another same sized knot. Within five feet of the other end is a one-half inch loose knot and a one-quarter inch of blue sap for six feet on thick edge.

Example 3. Piece ⅜x6-16. Contains white sap one-half the width of the whole length and is slightly damaged in two spots by bad mill work.

Example 4. Piece ⅜x6-16. Has a one-half inch black knot three feet from the end that partly covers when laid. A pitch streak two inches long four feet from the same end, a three-fourths inch black knot five feet from end and three-quarters of an inch of white sap for three feet on thick edge at the same end. One-half inch of white sap shows for two feet on thick edge of other end with two feet of shake that will cover when laid.

Example 5. Piece ⅜x6-16. Has five pin knots well scattered over face of piece. On thick edge is one-quarter inch of stained sap for three feet. On thin edge is a little shake that nearly covers.

Example 6. Piece ⅜x6-16. Has three knot holes on thin edge that will cover when laid and four black knots one-quarter inch to one-half inch in diameter, well scattered.

Example 7. Piece ⅜x6-16. Has one and one-half inches of sap on thick edge for two-thirds of the length. Within five feet of the end one foot of the sap is discolored and for two feet it is blue for three-quarters of an inch in width; a three-quarters inch knot on the thin edge. This piece has a very smooth appearance.

Example 8. Piece ⅜x6-16. Has a one and one-half inch black loose knot six feet from end, but otherwise is nearly perfect. This is considered a cutting strip.

Example 9. Piece ⅜x6-16. Has one-quarter inch of wane for four feet on thin edge. Two-thirds of the face is covered with bright sap, except a slight discoloration from a crossing in piling.

Example 10. Piece ⅜x6-16. Is perfect with the exception of three-fourths inch of blue sap running three-fourths the length of the piece on thick edge.

"D" Siding.

"D" Siding will admit of considerable shake season checks and stained sap. With or without either of these defects a piece may have a number of small knots well scattered over the face.

EXAMPLES.

Example 1. Piece ⅜x6-16. Shows three inches blue sap on thick edge for three feet and a few small pin knots.

Example 2. Piece ⅜x6-16. Has three black knots one inch in diameter, and slight touch of shake.

Example 3. Piece ⅜x6-16. Looks to be clear, but contains considerable close shake.

Example 4. Piece ⅜x6-16. Has twelve small red and black knots well scattered, in size from one-quarter to one-half inch.

Example 5. Piece ⅜x6-16. Considerable blue and white sap; one-half of piece shows white sap and the other is stained, but not very blue.

Example 6. Piece ⅜x6-16. The face of this piece is covered with blue sap for about seven feet; the remainder is perfect.

Example 7. Piece ⅜x6-16. Slightly blue stain covers the entire face; otherwise perfect.

"E" Siding.

1. This is the lowest recognized grade of Beveled Siding and will admit of the stain, knot and shake defects not admissible in "D" Siding.
2. Many pieces showing seriously defective mill work are found in this grade.

FLOORING.

"A" Flooring.

1. "A" Flooring is a one-faced strip and should lay with a practically clear face.
2. A half inch of bright sap, or one or two small pin knots are admissible in this grade.

See General Instructions.

EXAMPLES.

Example 1. Piece 1x6-16. Has no defect.
Example 2. Piece 1x6-14. Has two small black pin knots; no other defects.
Example 3. Piece 1x6-12. Has a strip of perfectly bright sap on one edge three feet in length, varying in width from one-quarter to one-half inch; no other defect.

"B" Flooring.

"B" Flooring will admit of any amount of white sap, or two or three knots from a quarter to half an inch in diameter.

EXAMPLES.

Example 1. Piece 1x6-16. Free from all defects except a rough spot caused by dressing.
Example 2. Piece 1x6-16. Has bright sap on edge one-half inch wide for half length of piece, and a small pin knot less than one-half an inch.
Example 3. Piece 1x6-14. Has at one end one and one-half inch white sap, tapering off and disappearing at three feet from end; no other defect.
Example 4. Piece 1x6-16. Has two small knots six feet apart, black but sound, one a full half inch in diameter, and the other smaller.
Example 5. Piece 1x6-12. The entire face is white sap; no defects.

"C" Flooring.

"C" Flooring will admit of bright sap face or two knots one inch in diameter, or three to five knots one-half inch or less in diameter, but not a combination of these defects unless of a decidedly less amount, and must be practically free from shake.

EXAMPLES.

Example 1. Piece 1x6-14. Has a one-inch firm, sound, black knot, near the center of the piece; one three-eighths inch black, sound knot six feet from end and one and one-fourth inch knot four feet from same end; also eighteen inches of bright sap.
Example 2. Piece 1x6-16. At eight inches from end has one three-eighths inch knot; at three feet has one-fourth inch knot and at center two three-eighths inch knots, all being sound and black. At the other end one and one-half inches bright sap for ten feet.
Example 3. Piece 1x6-14. Contains three small pin knots well scattered and a small pitch pocket three-eighths inch long near end. At the other end is eighteen inches of light shake; smooth appearance.
Example 4. Piece 1x6-16. Has five small black knots, the largest being one-fourth inch in diameter. Otherwise the piece is perfect.
Example 5. Piece 1x6-14. Has eight small one-fourth inch black knots and one-half inch of bright sap for five feet at the end.
Example 6. Piece 1x6-16. Has three inches of bright sap on one edge for full length of piece, except that the sap near one end is slightly stained, but the piece as a whole is very smooth in appearance.

"D" Flooring.

1. "D" Flooring is a grade between No. 1 Fencing D. & M. and "C" Flooring, and will admit in a general way the imperfections of both grades.
2. In a knotty type the knots must be smaller and fewer in number than in No. 1 Fencing, and may be either red or black.
3. Medium stain covering entire face is allowed or tight local shake or season checks equal to shake defects.
4. Defects requiring one cut, not to exceed four inches of waste are allowed in high line pieces 12 feet long and longer.

EXAMPLES.

Example 1. Piece 1x6-12. Has blue sap over the entire face for one-third of its length, but no other defects. This is considered the limit of blue sap admissible.
Example 2. Piece 1x6-16. Has blue sap across the face for three feet in center of the piece, and two one-half inch red sound knots two feet from each end.
Example 3. Piece 1x6-16. Has fifteen sound black knots ranging from a half inch down to pin knots and well scattered; also three-fourths inch white sap on one edge for two-thirds of the length.
Example 4. Piece 1x6-16. Has one-half face bright sap with four one-half inch black knots and six pin knots well scattered.

Example 5. Piece 1x6-16. Has one black knot three-fourths by one and three-fourths inches five feet from one end, and two and one-half inch knots near other end, with slight pitch streak in center of piece for two feet.

Example 6. Piece 1x6-14. Has ten sound, black knots, the largest two being three-fourths inch in diameter and bright sap covering nearly entire face.

Example 7. Piece 1x6-14. Has one black knot, one by one and three-fourths inches in center of piece and a one-inch knot two inches from end. Also a rough spot near large knot in center.

Example 8. Piece 1x6-12. At five feet from one end has one rotten knot, one and one-half inches in diameter. Otherwise the piece is perfect.

Example 9. Piece 1x6-14. Has stained sap on each edge of piece full length, the sap varying in width from one to one and one-half inches; no other defects.

Example 10. Piece 1x6-16. Has ten small knots, all red, well scattered, averaging one-half inch in diameter. If the knots had been somewhat larger this piece would have graded No. 1.

Farmers' Clear Flooring.

1. Farmers' Clear Flooring is of a practically clear appearance.
2. The knotty defects shall not exceed that of a "C" Flooring.
3. The leading defect is shake, which may be scattered over the face of the strip.

EXAMPLES.

Example 1. Piece 1x6-16. Shows the knotty defects of a "C" flooring and has tight shake scattered over two-thirds of its face; good appearance.

Example 2. Piece 1x6-16. Shows two inches of blue sap for six feet on one edge; with considerable fine shake over the face; no other defects.

Example 3. Piece 1x6-16. At first appearance this piece seems to be free from all defects. On closer inspection it is found to be very shaky, but the shake is close and tight.

Example 4. Piece 1x6-16. Has no other defects than slightly stained sap covering the entire face.

No. 1 Fencing, D. & M.

This should be simply sound No. 1 Fencing worked to flooring, and of the character, when worked, described under the title of No. 1 Common Strips.

See General Instructions.

EXAMPLES.

Example 1. Piece 1x6-16. Has twenty-two sound red knots, one being a horn knot three-fourths by four inches long; two knots in middle, side by side, are three-fourths of an inch in diameter and the balance of knots are one-half inch and less in size.

Example 2. Piece 1x6-16. Has four sound, red knots, the two largest being three-fourths inches by one and one-half inches, and is perfectly sound in every particular.

Example 3. Piece 1x6-16. There are seven round black knots and two red knots in this piece, the red knots being three-fourths inch in diameter and located near one end. The largest black knot is one and one-fourth inches in diameter and four feet from same end. The balance of knots are one-half inch and less, and well scattered. It also has a little shell shake at opposite end from large knot and is considered a liner between No. 1 and No. 2 Fencing on account of having a combination of defects mentioned.

Example 4. Piece 1x6-16. Has eighteen sound knots about one-half being black, and ranging in size from one-half inch to one inch in diameter. It is perfectly sound and is considered a good No. 1 strip.

Example 5. Piece 1x6-16. Has thirteen sound red knots averaging three-fourths inch in diameter, and two sound red knots one inch in diameter. At the center a little bright sap is shown and also one foot of wane on tongue.

Example 6. Piece 1x6-16. This is a sound heart piece containing seven red knots. One is a pitch knot well set and the balance are of small horn type.

Example 7. Piece 1x6-14. Has five perfectly sound red knots, one and one-half inches in diameter, and seventeen small red knots one-fourth to three-fourths inch in diameter. This is a typical piece of No. 1 Fencing.

Example 8. Piece 1x6-14. Has six sound red horn knots running from each edge and nearly meeting. These knots do not impair the strength of the piece.

Example 9. Piece 1x6-16. Has a small cluster of black knots at center, two one-half by one inch black knots near one end and nine other small black knots well scattered.

Example 10. Piece 1x6-16. This is a Norway strip, full of pitch and flat grained, free from other defects and but for grain would go into "C" and better.

Example 11. Piece 1x6-16. Has twenty-one small sound knots, the two largest being about one inch in diameter. On the back and at the center of the piece slight wane shows on both edges for thirteen

inches, but not enough to impair the tongue or groove.

Example 12. Piece 1x6-16. Has one one-half inch knot, three feet from one end; one three-eighths inch knot four feet from other end; one five-eighths inch knot near center; all knots sound and firmly set. The whole face of the piece is slightly stained with blue sap; no other defects.

No. 2 Fencing, D. & M.

This should be simply No. 2 Fencing worked to flooring, and of the character, when worked, described under the title of No. 2 Common strips.

See General Instructions.

EXAMPLES.

Example 1. Piece 1x6-14. Has eight black knots, three are one-half inch in diameter within three feet of one end and one of them is an edge knot, the other five knots are one and one-half inches in diameter, scattered over the face of the piece. At the opposite end from the large knots is a one-half inch hole where a knot has sloughed off in working.

Example 2. Piece 1x6-14. Has seven small black knots and would readily be admitted as a No. 1 strip if one of the edge knots had not come out in working.

Example 3. Piece 1x6-12. Has white sap full length of piece on one edge. One end has a streak of pitch averaging three-fourths inch for five feet at opposite end; an open pitch streak for two feet, and three one-inch knots.

Example 4. Piece 1x6-14. Has four black knots from one to one and three-fourths inches in diameter, two pitch knots one and one-half inches wide by four inches long, and seven knots one and one-half inches and smaller. All are well scattered over the face.

Example 5. Piece 1x6-16. At one end has one and one-half inch sound red knot and one one-half inch red knot. The center has two one-inch sound red knots and part of a one and one-half inch loose knot on grooved edge. Scattered over the face within six feet of other end are ten sound pin knots and three two-inch sound red knots.

Example 6. Piece 1x6-16. Has twenty-two black knots scattered over face, three being loose and on one edge a little light shake. None of these knots will exceed one inch in diameter.

Example 7. Piece 1x6-16. This is a smooth looking strip, its principal defect being a light shell shake extending over two-thirds of the face; also five small knots, well scattered, and a half-inch edge knot-hole.

Example 8. Piece 1x6-16. This is a sound, small knotted piece and would be No. 1 if it were not that a knot one inch by one-half inch is gone out of the edge.

Example 9. Piece 1x6-16. Is coarse in appearance on account of two large limb knots extending across the face; knots are red.

Example 10. Piece 1x6-16. Contains nine knots from one-half inch to one inch in diameter, part of them black and one edge knot partly broken out in dressing. On one edge is a slight trace of rot, but the piece is of a very sound character.

Example 11. Piece 1x6-16. Has sound red knots of all sizes up to two inches and has one inch of black sap for six inches on one edge. This is considered a fine type of No. 2.

Example 12. Piece 1x6-16. At first appearance looks like a "D" Flooring strip, the apparent defect being a half-dozen small knots averaging less than an inch. On close inspection considerable shake is found, rather more than is admissible in No. 1.

Example 13. Piece 1x6-16. Has too much blue stain to be admitted into either the grade of "D" or Shaky Clear Flooring, the entire face being covered, but on account of its otherwise good appearance is graded No. 2.

No. 3 Fencing, D. & M.

No. 3 Fencing D. & M. is the regular grade of No. 3 Fencing worked to flooring and may contain coarse knots, an occasional knot hole, splits, wane, worm holes, streaks of red rot, and a great deal of shake, but not a serious combination of these defects.

See General Instructions.

EXAMPLES.

Example 1. Piece 1x6-14. Has black knots five-eighths to one inch in diameter, three feet from end, knot sloughed off edge one-half to five-eighths inch. Five inches from same end and on same edge, knot five-eighths by one and one-fourth inches sloughed off.

Example 2. Piece 1x6-16. If free from shake this piece would make a good No. 1 Fencing Flooring, but has open shake clear across the face for one-half length of piece.

Example 3. Piece 1x6-16. Has ten branch knots across its face, average size one and one-fourth by two and seven-eighths inches, at intervals of say eighteen inches, running

the full length of piece; and also has sound red rot two inches wide in center of board running two feet at one end of piece.

Example 4. Piece 1x6-16. Has eight small rotten knots with firm rot stain extending from one knot to the other along the whole length of the piece. This piece has a decidedly unsound appearance at the first glance.

Example 5. Piece 1x6-16. Has four good sized branch knots on face, with some heart shake along the grooved edge; also three-fourths inch wane for two feet at one end of face. The back is also waney on both edges, so much so for half the length that the piece is almost slabby.

COMMON LUMBER

Common lumber may consist of White or Norway Pine, or a mixture of both.

The characteristic of Common lumber, as distinguished from Finishing, consists of a general coarseness of appearance, caused by various defects and combinations of defects, in a greater or less degree according to the grade.

No. 1 Common Boards and Strips

1. No. 1 Common Boards and Strips includes all sound, tight-knotted stock, whether red or black knots, free from very large, coarse knots, or any imperfections that will weaken the piece.

2. This grade should be of a character fitting it for ordinary use, except finishing purposes.

3. Knots, medium colored blue sap, or a small amount of shake are admissible if they do not affect the general utility of the piece.

See General Instructions.

EXAMPLES

Example 1. Piece 1x12-16. Has four red knots from one and one-half to two inches in diameter and one black knot one and one-half by three inches; also fourteen small knots, all sound and well scattered, these smaller knots varying in size from one-half to one and one-fourth inches.

Example 2. Piece 1x12-16. There are a great many knots in this piece, but they are well distributed, and are sound. Six of them are red, from one and one-half to two inches in diameter. Seven more red knots, about one and one-half inches, and four small, black knots not over an inch in diameter.

Example 3. Piece 1x12-14. Has the knot defects and general appearance of a "D" stock. It contains a dozen small sound black knots, and quite a little close shake at one end and an inch of blue sap on one edge, for nearly the full length of the piece. Without the shake it would pass easily for a "D" stock.

Example 4. Piece 1x8-16. Very smooth looking piece, but has six black knots, all sound, from one-half to one and one-half inches in diameter, and a slight touch of blue sap on edge.

Example 5. Piece 1x8-16. Worked to drop siding. Has four red knots about one and one-fourth inches in diameter, and eleven small sound red knots, in size from one-half to one inch in diameter.

Example 6. Piece 1x8-16. Worked to ship lap. Has a great deal of sap, a portion of which is slightly stained, and in addition seven red knots about an inch in diameter, and fifteen smaller ones ranging from one-fourth to one inch in diameter. This has a smooth appearance for No. 1.

Example 7. Piece 1x10-14. S. 2 S. This is a Norway board, smooth in appearance, with medium blue sap stain over entire face. Has six sound firmly set knots from one-fourth of an inch to one inch in diameter well scattered over face; no other defects.

No. 2 Common Boards and Strips

1. No. 2 Boards and Strips are subject to the same general inspection as No. 1, except that coarser and larger knots, not necessarily sound, more stained sap and shake are allowed. "V" and coarse limb knots, heart shake or slight trace of rot, when firm, or occasional worm holes, are defects admissible in this grade.

See General Instructions.

EXAMPLES

Example 1. Piece 1x12-16. Has seven black knots from one and one-half to two inches in diameter and eight smaller knots, part of which are red, and the others black; also shake at one end.

Example 2. Piece 1x12-16. Very smooth in appearance. Looks like a "D" stock; contains a number of small knots, and a great deal of close shake over the face of one-half of the board.

Example 3. Piece 1x12-16. Has six large branch or "V" shaped knots, all red, from one and one-fourth to one and one-half inches wide, and from three to four inches long; also a half-dozen smaller red knots from one to two inches in diameter.

Example 4. Piece 1x16-16. Has four large branch knots, all black, a little heart shake, or season check, a touch of red stain two inches wide at narrowest place, widening to five inches, in all about four feet in length; also eight or ten small knots well scattered.

Example 5. Piece 1x10-14. Has nine knots both red and black, from one and one-half to two inches in diameter; at least a dozen smaller knots from one-half to one and one-fourth inches, both red and black, all well scattered and firmly set.

Example 6. Piece 1x12-14. Contains ten red knots from two to three inches in diameter, and a half dozen smaller ones, all sound; also a single grub or worm hole.

Example 7. Piece 1x6-16. Has a great deal of blue sap, with a dozen small knots, both red and black, well scattered and sound.

Example 8. Piece 1x6-16. Has two red knots, two inches in size; four knots averaging an inch, and a half-dozen small ones. Type of a good No. 2.

Example 9. Piece 1x6-16. Has a streak of very firm red rot, from one-half to one inch wide, running six feet in length from one end. Also a half dozen small knots, well scattered. The rot is barely perceptible in the rough strip and it has therefore a smoother appearance than the average No. 2 Fencing strip.

Example 10. Piece 1x6-16. Has three large worm holes and considerable shake, both well scattered. In appearance very smooth, and an acceptable grade, whether used rough or D. & M.

Example 11. Piece 1x12-14. The face contains a large number of sound knots, and would be No. 1 were it not that it also has six white worm or grub holes, well scattered. If it were ten inches wide, not more than three or four worm holes would be admitted.

No. 3 Common Boards and Strips

1. The general appearance of this grade of lumber is coarse, admitting:
2. Large loose or unsound knots.
3. An occasional knot hole.
4. A great deal of shake.
5. Some red rot.
6. Large worm holes.
7. Any amount of blue sap.
8. Not a serious combination of these defects in any one piece is admissible.

See General Instructions.

EXAMPLES

Example 1. Piece 1x18-16. Badly split at one end for six feet, and sprinkled with a dozen knots.

Example 2. Piece 1x16-14. Very shaky all over, so much so that shake can be plainly seen; no other defects.

Example 3. Piece 1x14-14. Has twelve large knots from two to three inches in diameter, some of them soft and unsound. Also a half dozen small knots and a split two feet in length at one end.

Example 4. Piece 1x12-16. Has six large branch knots, very coarse in appearance and which materially weaken the board; otherwise sound.

Example 5. Piece 1x10-14. Worked to ship lap. Has four black knots about one and one-half inches in size and one knot hole of same size.

Example 6. Piece 1x10-14 Has eight small knots one inch in diameter. The knots are soft and rotten. If knots were sound, the board would pass for "D" stock.

Example 7. Piece 1x10-14. Worked to ship lap. Has four sound knots one and a half inches in diameter, and one unsightly, coarse, black knot, two inches wide and six inches long.

Example 8. Piece 1x10-16. Worked to ship lap. One end smooth and free from all defects except a few pin knots. The other end shows three feet containing red rot four to six inches in width.

Example 9. Piece 1x8-16. Worked to flooring. Shows a dozen small black knots and red rot, of a firm texture, over one-third of its face.

Example 10. Piece 1x10-16. Worked to shiplap. Has knot defects as are found in No. 1 Common, but also has a dozen large worm holes, well scattered, which made it a No. 3.

Example 11. Piece 1x10-14. Worked to shiplap. Has four large black knots, three inches in diameter, one of them rotten; also a few pin knots and a little blue sap.

Example 12. Piece 1x10-16. Full of coarse knots, all sound, but so extremely coarse in appearance that the board is classed as No. 3. Without two or three of the coarse knots it would be a satisfactory No. 2.

Example 13. 1x8-12. Worked to shiplap. Shaky all over, but smooth in appearance.

Example 14. Piece 1x6-16. Has one inch of wane on one edge and considerable blue sap. Also one small knot hole an inch in diameter, and one large coarse knot.

Example 15. Piece 1x6-16. Has streak of firm rot four feet long, from one to three inches wide; also some shake at other end.

Example 16. Piece 1x6-16. Has three coarse black knots from two to three inches in diameter.

Example 17. Piece 1x10-14. Has one large, sound knot two and one-half inches in diameter at one end of piece. Two feet from same end has rotten knot three-fourths inch in diameter and five feet from same end has dead sap two and one-fourth inches wide on each edge for four feet; also two good sized worm holes, one knot hole, three-fourths by one inch, and six feet from end one sound red knot, one and one-half inches in diameter.

Example 18. Piece 1x12-16. A nice, smooth looking board with the exception of a rotten limb knot one-half by two inches six feet from end and fourteen worm holes well scattered from end to end. Outside of above defects this piece would be a good No. 1 twelve-inch stock board.

Example 19. Piece 1x16-14. Four feet from end of this piece is a bunch of five large sound knots in size from one and one-half to three inches in diameter, and running along piece are six other sound knots ranging in size from one-half to one and one-fourth inches in diameter. Within four feet of the other end of piece there is a knot hole one and one-half inches in diameter, and an open gum seam about sixteen inches long.

Example 20. Piece 1x8-14. Has several small black knots one-fourth to five-eighths inch in diameter and three sound red knots from one and one-half to two inches in diameter. It also has two knot holes on same edge of board, one of them one and one-fourth by one and one-half inches in size and six feet from end of piece; the other, three-fourths by two inches and situated three feet from same end.

No. 4 Boards and Strips

1. The predominating defect characterizing this grade is red rot.
2. Other types are pieces showing numerous large worm holes, or several knot holes, or pieces that are extremely coarse knotted, waney, shaky or badly split.
3. Pieces, when extremely cross checked, are admissible in this grade.

See General Instructions.

EXAMPLES

Example 1. Piece 1x18-16. One-half of this board has the general appearance of a No. 2 common. The other half is composed of red rot, varying from firm to soft.

Example 2. Piece 1x12-16. Alternate streaks of white wood and red rot, fully one-half of the face being red.

Example 3. Piece 1x12-16. Contains a dozen large worm holes, considerable rot and a few coarse knots.

Example 4. Piece 1x12-14. Contains four large knot holes with other knot defects.

Example 5. Piece 1x12-16. Has the knot defect of a No. 2 board, but contains, also, twenty-five or thirty large worm holes. No rot or knot holes.

Example 6. Piece 1x12-12. Very badly split in two or three places. No serious rot or knot defects, but board is badly shattered.

Example 7. Piece 1x10-16. Three-fourths of the face of this board shows red rot, but very little soft rot.

Example 8. Piece 1x4-16. Shows a good face, but is excessively waney on back, there being four feet of it showing all slab. Face equal to No. 2 in quality.

No. 5 Boards

No. 5 Boards is the lowest recognized grade and admits of all defects known in lumber, provided the piece is strong enough to hold together when carefully handled.

JOISTS, SCANTLING AND TIMBER.

No. 1.

1. No. 1 joists and scantling must be of a good, sound character, but will admit of defects that do not impair the strength of the piece.
2. On basis of 2x4, wane on edge is admissible, one-half inch deep, for half the length, or a proportionate amount for a shorter distance or on both edges. In any case, one side and two edges should allow a good nailing surface, it being understood, however, that the wane shall in no case extend over one-half the side of the piece.
3. A few worm holes admissible.
4. Stained sap is not considered a defect.
5. Timbers and 3-inch plank admit proportionately greater defects.
6. 2-inch dimension of this grade may contain 20 per cent of No. 1 tamarack, and 3-inch and thicker and timbers may contain any amount of No. 1 tamarack.

No. 2.

1. No. 2 will admit of large, coarse knots, not necessarily sound, considerable wane, also shake, worm-holes, red, dozy streaks, crooked pieces or other defects which weaken or impair the pieces to such an extent as to render it unfit for No. 1 grade.
2. Any amount of No. 2 Tamarack is admissible in this grade.

No. 3.

No. 3 will admit a great deal of rot and all the imperfections allowed in No. 1 and No. 2, but in a much more pronounced form, and any amount of No. 3 tamarack.

TANK STOCK

1. **Tank Stock** shall be of dimension sizes, square edged, practically free from wane and shake, and may have any number of sound, water-tight knots.

2. White sap is no defect.

SELECT COMMON

1. **Select Common** shall be of dimension sizes, and of a smooth, common appearance on the face side.

2. White sap shall not be considered a defect in this grade.

3. A slight amount of stain is admissible on the face, and any amount of sound, stained sap on the back.

4. A small amount of shake may show on the face when not in combination with other marked defects.

5. Any quantity of small sound knots, red or black, that do not give too coarse an appearance to the piece, are admissible.

6. The face of piece should be practically free from wane, while the back may show a moderate amount, as well as other defects.

THICK COMMON LUMBER

GENERAL RULE.

Common lumber, one and one-fourth inches and thicker, shall be graded the same as inch lumber.

No. 1 Common

No. 1 Common shall be white pine unless otherwise specified, 4 inches or wider, and shall be graded the same as No. 1 Common Boards.

No. 2 Common

No. 2 Common shall be white pine unless otherwise specified, 4 inches or wider, and shall be graded the same as No. 2 Common Boards and Strips.

No. 3 Common

No. 3 Common shall be 4 inches or wider and graded the same as No. 3 Common Boards and Strips.

No. 4 Common

No. 4 Common shall be 4 inches or wider, and graded the same as No. 4 Common Boards and Strips.

No. 5 Common

No. 5 Common shall be 4 inches or wider and graded the same as No. 5 Common Boards and Strips.

FACTORY LUMBER

Factory Plank

1. Grades as described under this head are valued for cutting up qualities only, and should not be confounded, either in quality or value, with grades outlined in another part of this book for yard purposes.

2. Factory plank of all kinds, better than No. 3 Shop, shall be graded for the percentage of Door cuttings that can be obtained.

3. Two grades of Door cuttings only shall be recognized, and are to be known as No. 1 and No. 2 cuttings.

4. The only defect admissible in No. 1 Door Cuttings is white sap.

5. The grade of No. 2 Door Cuttings will admit of one defect only in any one piece. This may be a small knot of sound character, not to exceed five-eighths of an inch in diameter, or the defect may be slightly stained sap, which does not extend over more than one-half the surface of the piece on one side.

Shop Common

No. 1 Shop Common—The sizes and grades of cuttings admissible in the grade of No. 1 Shop Common are as follows:

1. No. 1 Stiles in width 5¼ or 6 inches, and in length from 6 feet 8 inches to 7 feet 6 inches.

2. No. 1 Rails, 9 or 10 inches wide and from 2 feet 4 inches to 3 feet in length.

3. No. 1 Muntins 5¼ inches wide and from 3 feet 6 inches to 4 feet in length.

4. Any number of pieces of either the Stiles or Rails mentioned above are admissible in the grade of No. 1 Shop Common; but only two Muntins of the sizes men-

tioned above shall be considered, and one No. 2 door Stile may also be considered in securing the required percentage of cuttings in any given plank.

5. Each plank of No. 1 Shop Common shall contain not less than 50 per cent, nor more than 70 per cent, of Door cuttings of the sizes and grades above mentioned.

No. 2 Shop Common—The sizes admissible in No. 2 Shop Common are as follows:

1. Stiles in width 5¼ inches or 6 inches and from 6 feet 8 inches to 7 feet 6 inches in length.

2. Rails 9 or 10 inches in width and from 2 feet 4 inches to 3 feet in length.

3. Top Rails 5¼ inches wide and from 2 feet 4 inches to 3 feet in length. Top Rails must, however, be of No. 1 Door cuttings quality, but figured as No. 2 Door cuttings.

4. Muntins 5¼ inches wide and from 3 feet 6 inches to 4 feet in length.

5. Any number of cuttings of any one of the above sizes are admissible in the grade of No. 2 Shop Common.

6. Each plank of No. 2 Shop Common shall contain either one of the following: At least 25 per cent of No. 1 Door Cuttings, or not less than 40 per cent of all No. 2 Door Cuttings, or not less than 33⅓ per cent of No. 1 and No. 2 Door Cuttings combined.

No. 3 Shop Common, one and one-fourth inches and thicker, will admit all below the grade described as No. 2 Shop Common that is of a cutting type, and suitable for sash, door or other cuttings.

Factory Selects

Factory C Select—The grade of Factory C Select shall contain from 70 to 80 per cent of No. 1 Door cuttings in the sizes specified as admissible in No. 1 Shop.

Factory B Select—The grade of Factory B Select shall contain from 80 to 90 per cent of No. 1 Door cuttings in the sizes specified as admissible in No. 1 Shop.

Factory A Select and Better—The grade of Factory A Select and Better shall consist of all Plank cutting more than 90 per cent of No. 1 Door cuttings of the sizes specified as admissible in No. 1 Shop Common.

Note: All factory plank shall be graded from the poor side, and in determining the percentages of door cutting, consideration must be given to the fact that plank are to be ripped full length in such manner as will yield the highest grade and largest percentage of door cuttings before cross cutting, except in such cases where plank will yield a higher value by being first cross cut for rails. In such instances as when stock is cross cut for rails, where some of the stock so obtained is too poor for either No. 1 or No. 2 rails, and which yet contains stiles or muntins, or top rails, which can be obtained by ripping this cross cut stock, the door cuttings so obtained shall be figured in, when determining percentages.

Inch Shop Common

1. There shall be only one grade of Inch Shop Common.

2. Cuttings shall be 9½ inches wide or wider, and 18 inches long or longer; or, 5 inches wide or wider and 3 feet long or longer.

3. Cuttings 9½ inches wide or wider and less than 3 feet long shall be free from defects on both sides, except white sap.

4. Cuttings 5 inches wide or wider and 3 feet long or longer shall have a C Select or Better face.

5. Each piece of Inch Shop Common shall contain 50 per cent or more of any one cutting, or combination of cuttings, described in the foregoing rules for this grade.

SHORT BOX

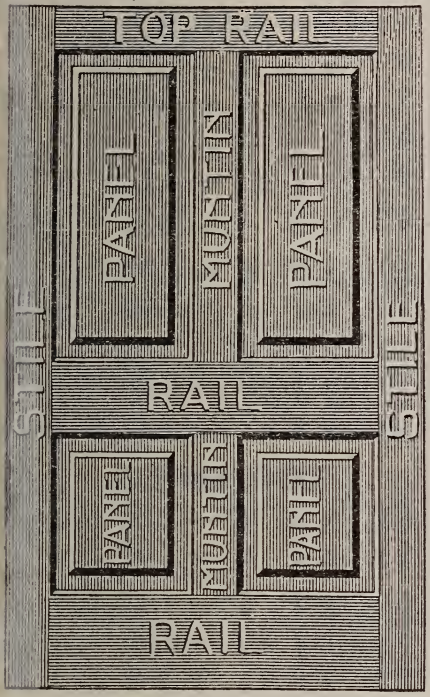
Short Box shall include lumber twelve to forty-seven inches long inclusive, three inches and wider, and No. 4 and better.

RULES FOR MEASUREMENT OF FACTORY PLANK

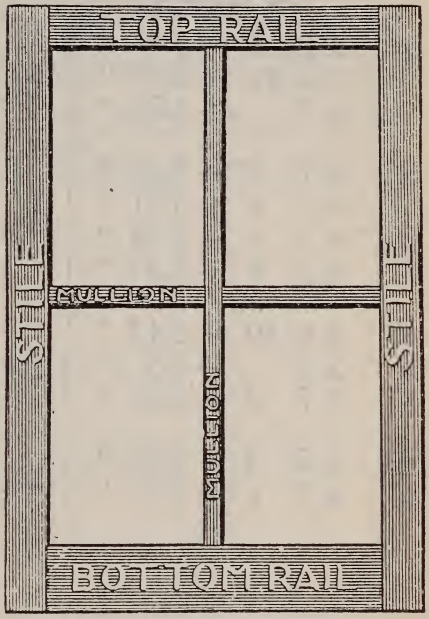
Factory Plank may be measured with either a rule or a tape line.

When a rule is used, the number of feet nearest the actual measurement shall be taken.

The additional thickness over inch shall be added to the surface measurement of the total amount measured.



DOOR, SHOWING CUTTINGS.



SASH, SHOWING CUTTINGS.

DOOR CUTTINGS

The figures on the left of the brackets show the number of feet and decimal parts in each cutting.

The figures on the right, show the number of feet and approximate fractions of a foot in each piece of cutting grouped within the various brackets. These fractional figures on the right of the brackets are sufficiently accurate for practical purposes and are to be used in computing the percentage of cuttings in a factory plank.

STILES.

5¼″ x 6′ 8″ — 2.92 ft.		
5¼″ x 6′ 10″ — 2.99 “	}	3
5¼″ x 7′ — 3.06 “		
5¼″ x 7′ 2″ — 3.14 “		
5¼″ x 7′ 4″ — 3.21 “		
5¼″ x 7′ 6″ — 3.28 “	}	3¼
6″ x 6′ 8″ — 3.33 “		
6″ x 6′ 10″ — 3.42 “		
6″ x 7′ — 3.5 “	}	3½
6″ x 7′ 2″ — 3.56 “		
6″ x 7′ 4″ — 3.66 “	}	3¾
6″ x 7′ 6″ — 3.75 “		

MUNTINS

5¼″ x 3′ 6″ — 1.53 ft	}	1½
5¼″ x 3′ 8″ — 1.6 “		
5¼″ x 3′ 10″ — 1.68 “	}	1¾
5¼″ x 4′ — 1.75 “		

RAILS.

9″ x 2′ 4″ — 1.75 ft.	}	1¾
9″ x 2′ 6″ — 1.875“		
9″ x 2′ 8″ — 2. “	}	2
9″ x 2′ 10″ — 2.125“		
9″ x 3′ — 2.25 “	}	2¼
10″ x 2′ 4″ — 1.94 “	}	2
10″ x 2′ 6″ — 2.08 “		
10″ x 2′ 8″ — 2.22 “	}	2¼
10″ x 2′ 10″ — 2.36 “		
10″ x 3′ — 2.5 “	}	2½

TOP RAILS.

5¼″ x 2′ 4″ — 1.02 ft.	}	1
5¼″ x 2′ 6″ — 1.09 ft.		
5¼″ x 2′ 8″ — 1.17 ft.		
5¼″ x 2′ 10″ — 1.24 “	}	1¼
5¼″ x 3′ — 1.31 “		

LATH

Owing to the rapidity with which Lath are manufactured and necessarily handled in grading, the misplacement of an occasional piece is practically unavoidable. For this reason a variation of ten per cent or less off grade is provided for in our rules. This provision is intended to cover accidentally misplaced pieces only, and every reasonable effort should be made to have the grades conform to the specifications without regard to this percentage provided for misplaced pieces.

No. 1 White Pine Lath

1. No. 1 White Pine Lath shall be butted to not less than thirty-one and three-fourths inches or forty-seven and three-fourth inches long; not more than one-eighth of an inch scant of one and one-half of an inch wide; and not more than one-sixteenth of an inch scant of three-eighths of an inch thick; and of sound material.

2. Will admit wane one-third the thickness, and one-third the width for one-third the length on one side of the piece or its equivalent otherwise located when not in combination with other serious defects.

3. Any number of pin knots, three or four three-quarter inch knots well scattered, or more smaller knots, all well set, firm and sound, that do not weaken the piece, are admissible in a four-foot, and a proportionately less amount in a thirty-two inch No. 1 lath.

4. Firm, fine shake extending over one-half the surface of the piece that does not materially impair its strength, is admissible when not in serious combination with other defects.

5. A few worm holes in an otherwise sound piece are admissible.

6. Stain shall not be considered a defect, although mould that has caused the surface of the piece to decay or scale off, is a defect not admissible in this grade.

7. Ten per cent or less of No. 2 lath shall be allowed in this grade.

No. 1 Mixed Lath

No. 1 Mixed Lath shall be graded by the same rules and specifications, and subject to the same percentage of No. 2 given for No. 1 white pine lath, and may consist of a mixture in any proportions of any two or more of the following named woods: White Pine, Norway Pine, Jack Pine, Spruce and Balsam, and not to exceed twenty per cent of Tamarack.

No. 2 Lath

1. No. 2 Lath may consist of any one or a mixture in any proportions of any two or more of the following named woods: White Pine, Norway Pine, Jack Pine, Spruce, Balsam and Tamarack.

2. Pieces of No. 1 quality with an average of not more than one-fourth of an inch scant in width, and one-eighth of an inch scant in thickness are admissible.

3. No. 2 Lath may contain firm streaks and patches of rot; sound knots; an occasional loose knot or knot-hole; dead wood, worm holes, wane, season checks, shake and pitch-pockets, that by themselves or in combination with these or other defects do not seriously impair the usefulness of the piece.

4. Both ends of a No. 2 lath should have at least an inch in width of firm wood for nailing.

5. Ten per cent above or below this grade is admissible.

Association Standard Grades OF POPLAR, OAK, COTTONWOOD, GUM AND OTHER HARDWOODS

Classification, Official Grading and Inspection Rules of

The Hardwood Manufacturers' Association of the United States

With amendments, corrections and additions, which the different organizations set out below will conform to and be governed by for a period of five years from the date hereof. The agreement ratifying the amendments, corrections and additions also not to be changed for the said period of five years, except by and with the consent of all parties and Associations who have signed the said agreement.

APPROVED AND ADOPTED BY

THE EASTERN STATES RETAIL LUMBER DEALERS' ASSOCIATION

HUGH McILVAIN,
Chairman, Philadelphia, Pa.
RICHARD S. WHITE,
President, New York.

THE NEW YORK LUMBER TRADE ASSOCIATION

PATRICK MOORE,
Chairman, New York.
R. J. PERRINE,
President, New York.

THE HARDWOOD MANUFACTURERS' ASSOCIATION OF THE UNITED STATES

R. H. VANSANT,
Chairman, Ashland, Ky.
W. E. DE LANEY,
President, Cincinnati, O.

SALES CODE AND INSPECTION RULES

Title

These Terms, Rules and Regulations were adopted by the Hardwood Manufacturers' Association of the United States, February 3, 1910, at their Eighth Annual Meeting, held at Cincinnati, Ohio, and are known as the Sales Code and Inspection Rules of the Hardwood Manufacturers' Association of the United States.

Purposes

When quotations, orders and contracts covering the sale of forest products in which the members of this Association deal, contain the clause "subject to the Sales Code and Inspection Rules of the Hardwood Manufacturers Association of the United States, adopted February 3, 1910," they shall be governed and controlled (with such exceptions as are specifically made in writing) by the following:—

SALES CODE

General Contingency Clause

1. Quotations are based upon and orders and contracts accepted under a "General Contingency Clause," which recognizes that the Seller shall not be held liable for delays or non-deliveries of material, when occasioned by strikes, floods, fires, epidemics, car supply, delays of carriers or any other causes, whatsoever, beyond the control of the Seller. In any of these events, the Seller may suspend further performance under the same until such causes and their effects shall have been removed.

Prior Sale—Change Without Notice—Credit Rating.

2. All quotations are made subject to prior sale, change without notice, and Purchasers' credit rating proving satisfactory.

Written Order.

3. All orders and contracts shall be in writing.

Order Acceptance

4. All orders and contracts are subject to approval and acceptance at the Main or Home Office of Seller, and are not binding unless confirmed in writing. Such acknowledgment shall contain all data appertaining to order, and shipment to be made in accordance therewith. Omissions and errors shall be corrected by the Purchaser in return mail. All forms used shall show the address of Main or Home Office of Seller.

Delivered Price—Freight Rates—Switching Charges—Damage

5. The delivered price (f. o. b. destination) includes only the usual freight charges to point of delivery mentioned, and are based upon the freight rates in effect at

time of quotation, with no allowance for switching or other terminal charges at destination. The Seller does not guarantee the continuance of those rates. In the event that freight rates change after acceptance of order and before date of shipment, either party may cancel the contract, if the other party refuses to make the price accord with the changed rates. The Seller does not guarantee safe delivery, nor insure against breakage, loss or damage to material while in transit.

Time of Shipments

6. (a) When order, or contract specifies a finite time for shipment, failure to ship within said time gives the Purchaser the privilege of cancelling the order or contract by wire. (b) When no definite time for shipment is specified, the Purchaser shall not be entitled to cancel such order or contract inside of thirty days from the date of order or contract without the consent of the Seller. Whenever shipments are not made within thirty days, the Seller shall forthwith notify the Purchaser, giving reasons for failure to ship. Purchaser shall then have the privilege of forthwith cancelling by wire. Should Purchaser fail to so cancel, the Seller shall have an additional thirty days in which to ship; provided, however, that in case of Special or Worked material on hand at time of cancellation, all material must be accepted by Purchaser.

All material en route or loaded preparatory to shipping on such orders, at date of receipt of cancellation, at Home or Main Office of Seller (with three days' grace if Home or Main Office of Seller is not at point of shipment), shall be likewise accepted. Otherwise order or contract shall remain in effect until cancelled by mutual consent.

Terms of Payment

7. Seller must promptly send to Purchaser an invoice for each carload, or other shipment. Each invoice is due and payable as follows: Freight is due upon arrival of shipment, and must be paid by Purchaser; original "Expense Bill" (or certified copy thereof) must be sent to Seller; balance of invoice (remainder after deducting freight) is due sixty days from date of shipment and bears interest after maturity; provided however, that Purchaser may pay the same ten days after date of invoice with a discount of 2%; or thirty days after date of invoice, with a discount of 1%.

All payments must be made in funds at par New York or Chicago. Omissions and errors in invoice are subject to correction.

Credit

8. If, during the life of any order, or contract, the financial responsibility of the Purchaser becomes impaired or unsatisfactory to the Seller, cash payments, with above discounts, or satisfactory security, may be demanded, in default of which, the order or contract may be cancelled by the Seller.

Reinspection

9. In event of complaint by Purchaser on the quality of material shipped, Purchaser shall pay freight, unload and hold rejected lumber intact, properly protected, and shall file complaint with Seller within five days after receipt of shipment. If on quantity, the entire shipment must be held intact. Payment of freight or invoice shall not be considered as an acceptance of the shipment, nor shall such payment work a forfeiture of the right to enter complaints and make corrections.

Upon receipt of complaint by Seller, shipper shall at once request the Secretary of the Hardwood Manufacturers' Association to have reinspected the shipment in accordance with the rules of the Hardwood Manufacturers' Association of the United States in effect at the time of execution of contract, and the purchaser shall lend reasonable assistance in the reinspection thereof.

Certificates will be issued by the said Association showing the original shipper, the Purchaser and the results of such reinspection, the original being mailed to the shipper and the duplicate to the Purchaser.

Settlement on Reinspection

10. Both Seller and Purchaser shall be bound by such reinspection.

The Purchaser shall accept all material of the grade purchased, and all of the next lower grade not in excess of 5% of the total quantity invoiced, and shall pay for said grade at current proportionate prices as shown by the latest publication of market conditions issued by the Hardwood Manufacturers' Association. All de-grades in excess of 5% shall be the property of the Seller.

THE STANDARD THICKNESSES FOR DRESSED LUMBER

Rough Stock.				Dressed Stock.
3/8"	surfaced	two	sides to	7/32"
1/2"	"	"	" "	5/16"
5/8"	"	"	" "	7/16"
3/4"	"	"	" "	9/16"
1"	"	"	" "	13/16"
1 1/4"	"	"	" "	1 3/32"
1 1/2"	"	"	" "	1 11/32"
1 3/4"	"	"	" "	1 1/2"
2"	"	"	" "	1 3/4"
2 1/4"	"	"	" "	2"
2 1/2"	"	"	" "	2 1/4"
2 3/4"	"	"	" "	2 1/2"
3"	"	"	" "	2 3/4"
3 1/4"	"	"	" "	3"
3 1/2"	"	"	" "	3 1/4"
3 3/4"	"	"	" "	3 1/2"
4"	"	"	" "	3 3/4"

GENERAL INSTRUCTIONS FOR THE MANUFACTURE, INSPECTION AND MEASUREMENT OF HARDWOOD LUMBER

Manufacture

1. Lumber shall be manufactured of practically uniform thickness and square edges, with all ragged ends trimmed off.

Inspection

2. The location, size, and kind of defects have much to do with the value of a board, and the inspector must depend to some extent on his own judgment, guided by the following rules:

3. In inspecting all lumber, both sides of the piece shall be taken into consideration in making the grade.

4. The face side of lumber is the side showing the best quality or appearance.

5. Pieces of lumber that would take two or three standard defects may have large defects equal in damage to two or three standard defects.

6. In grades below First and Seconds and in woods where no Select grade is provided, boards 6 inches and over wide with one clear face shall be raised a grade above the reverse side.

7. Lumber shipped rough must be accepted on grades as shown in the rough, and not subject to any changes which may be caused by future mill working, except as to stained sap, as hereinafter stated.

8. Sap that will show bright after dressing to standard thickness shall be considered bright; all sap to be estimated on the average.

9. Any stain that will show bright after dressing to standard thickness shall not be considered a defect.

10. Splits that do not diverge more than one inch for each foot in length are to be considered straight splits.

11. Ordinary season checks are not to be considered defects.

12. A straight split not exceeding 6 inches in length in one end of a piece of lumber 8 inches and over wide shall not be considered a defect.

13. The rules for the inspection of lumber are intended to define the poorest piece that will go into a given grade; all the better boards up to the next higher grade being also included in the grade described. In line boards twelve feet and longer shall be given advantage in grade, and eleven feet and shorter reduced.

14. **Clear face cuttings** must show one face clear of all defects excepting bright sap, except as hereinafter stated.

The reverse side of Clear Face Cuttings may contain small defects or one large defect and not exceeding 2 inches in diameter that will not materially weaken the strength of the piece, and that will not show through to the face when worked.

Sound cuttings may contain firm knots, pin worm holes, sap and other defects which would not materially weaken the strength of the piece.

The word "Cuttings" is intended to include both rippings and cuttings.

15. **Log run** means the full run of the log with all boards included that will make 50% or better into sound cuttings. The smallest cutting allowed must contain 4 square inches and must not be shorter than 2 feet nor narrower than 3 inches, Walnut and Cherry excepted, which will allow a minimum of 33⅓% sound cuttings and the dimensions for the smallest cutting to be the same as above.

16. **Common and better** means the full run of the log with all grades below No. 1 Common excluded. This grade must contain at least 25% of Firsts and Seconds.

16a. The percentages of Firsts allowed in the combined grade of Firsts and Seconds in the different woods are as follows:

50%—Poplar.

40%—Basswood, Soft Elm, Mexican Mahogany, Cottonwood.

35%—African Mahogany.

33⅓%—White Ash, Birch, Hard Maple, Chestnut, Sycamore, Red and White Oak (Plain and Quartered), Buckeye, Red and Sap Gum.

25%—Soft Maple, Brown and Black Ash, Cuban Mahogany.
20%—Beech, Butternut, Rock Elm, Hickory. Pecan, Walnut and Cherry.

Measurement

17. Lumber must be inspected and measured as the inspector finds it, of full length and width. He shall make no allowance for the purpose of raising the grade.

18. In the measurement of all lumber, fractions exactly on the half foot are to be dropped, and all fractions above the half foot are to be counted to the next higher figure on the board rule.

19. A careful piece tally must be kept of all lumber showing the face measure. This shall be considered the board measure in all lumber one inch and thinner. To obtain the board measure in stock thicker than one inch, multiply the face measurement by the thickness in inches.

20. In the absence of the shortest lengths in the grade where the same is allowed, the per cent of the next longer lengths may be increased proportionately.

21. Tapering lumber shall be measured at one-third the length of the board from the narrow end except strips.

22. All widths and lengths mentioned in these rules shall be inclusive.

23. The standard lengths are four to twenty feet, with fifteen per cent of odd lengths in feet in any grade admitted as standard lengths.

24. The standard thicknesses for rough stock are: 3/8, 1/2, 5/8, 3/4, 1, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/4, 2 1/2, 2 3/4, 3, 3 1/4, 3 1/2, 3 3/4 and 4 inches. 10% of the shipment may be 1/16" scant of the standard thickness.

Standard Defects

25. Each one of the following items constitute a standard defect, any of which may appear in the board up to the limit specified in the rule covering its quality.

a. One knot one and one-fourth inches in diameter.

b. Two knots so located that they will not exceed in damage one standard knot.

c. Worm holes, grub holes, or rafting pin holes not exceeding in damage one standard knot.

d. Heart, shake, rot, dote, or any other defects not exceeding in damage one standard knot.

e. Bark or waney edge not to exceed one inch in the average, running not to exceed one-third the length of the board, only showing on one side and to be measured.

POPLAR

General Instructions, and the following rules are to govern the inspection:

Bright Burls that will dress smooth are not to be considered defects in any grade.

Sound Gum Spots are no defect in any grade. Open Gum Spots to be considered by the inspector.

The standard lengths and thicknesses are as designated under the heading of each grade.

Grades and Nomenclature

The following are the standard grades of Poplar lumber adopted and the terms by which they are to be known:

Rough Stock

Grades.	Standard Thicknesses.
Panel and Wide No. 1	3/8 to 2 inches
Fas or Firsts and Seconds combined as one grade	3/8 to 4 inches
Selects	3/8 to 4 inches
Saps	3/8 to 2 inches
Wide No. 2	3/8 to 2 inches
No. 1 Common	3/8 to 4 inches
No. 2 Common	3/8 to 4 inches
No. 3 Common	3/8 to 4 inches
No. 4 Common	3/8 to 4 inches
Scoots	3/8 to 4 inches
Car Sign Boards	1 to 2 1/2 inches
Wagon Box Boards	1 inch
Shorts	3/8 to 4 inches
Strips	3/8 to 2 inches

Quartered Poplar

Fas or Firsts and Seconds	5/8 to 2 inches
No. 1 Common	5/8 to 2 inches
No. 2 Common	5/8 to 2 inches

Squares

4x4, 5x5, 6x6, 7x7, 8x8, 9x9, 10x10, 11x11, and 12x12.

Fas or Firsts and Seconds.

No. 1 Common.

Panel and Wide No. 1

Panel and Wide No. 1 are combined as one grade.

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet and not to exceed 10% under 10 feet.

Widths: 18 inches and over.

Thicknesses: 3/8 to 2 inches.

Bright sap no defect.

Panel.—8 and 9-foot lengths must be clear.

Seventy-five per cent of the total quantity must be clear of defects on both sides; the balance of the quantity may contain three defects, provided ninety per cent of the piece can be used for Panels four feet and longer, in the full width of the board.

Splits six inches long in one end not to be considered a defect in any board; splits longer than six inches not to be admitted.

Wide No. 1.—8 and 9-foot lengths will admit one standard defect.

10 and 11-foot will admit two standard defects.

12 to 16-foot will admit three standard defects.

17 to 20-foot will admit four standard defects.

Splits admitted not to exceed fifteen inches in not to exceed ten per cent of the pieces.

Firsts and Seconds (Fas).

Lengths: 8 feet and over, admitting 15% of odd lengths 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 7 to 17 inches, up to 2 inches thick, 2¼ inches and thicker, 7 inches and over wide.

Thicknesses: Standard.

Firsts shall be 8 inches and over wide.

8 to 9 inches must be clear.

10 to 11 inches will admit 1 inch of bright sap.

12 to 14 inches will admit one standard defect and 2 inches of bright sap, or 4 inches of bright sap if there are no knots or equal defects.

15 to 17 inches will admit two standard defects, or one standard defect and 3 inches of bright sap, or 6 inches of bright sap if there are no knots or equal defects.

Seconds shall be 7 inches and over wide.

7 inches must be clear.

8 inches will admit 1 inch of bright sap.

9 to 11 inches will admit one standard defect and 1 inch of bright sap, or 3 inches of bright sap or equal defects.

12 to 14 inches will admit two standard defects and 2 inches of bright sap, or one standard defect and 4 inches of bright sap, or 5 inches of bright sap if there are no other defects.

15 to 17 inches will admit three standard defects or two standard defects and 3 inches of bright sap, or 6 inches of bright sap if there are no other defects.

Splits not to exceed in length the width of the board admitted and to be considered one standard defect, and not over twenty per cent of the whole in either quality may be so split.

Selects

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 6 inches and over.

Thicknesses: Standard.

Selects shall include the following different kinds of boards:

1. A board having a face side as good as a First, the other side must be as good as a No. 2 Common. Sun checks admitted on the poor side of this board.

(2) A board having a face side as good as a Second, the other side must be as good as a No. 1 Common.

(3) A board that has one more standard defect than would admit it to a Second. Examples:

(a) A board 6 to 7 inches wide with one standard defect.

(b) A board 8 inches wide with 1 inch of bright sap and one standard defect.

(c) Boards 9 and 11 inches wide with 2 inches of bright sap and two standard defects, and accordingly as widths increase.

Splits not to exceed the width of the board up to 10 inches are admitted. Boards over 10 inches in width will admit a split one-sixth the length of the board.

Saps

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 4 to 17 inches.

Thicknesses: Standard.

Saps will admit standard defects as follows:

Up to 10 inches wide, none.

11 to 12 inches wide, one.

13 inches and wider, two.

Splits not to exceed the width of the board up to 10 inches are admitted. Boards over 10 inches in width will admit a split one-sixth the length of the board, if there are no other defects.

Bright sap or sap that will show bright after dressing to standard thickness admitted.

Wide No. 2

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 10% under 10 feet.

Widths: 18 to 23 inches, 24 to 27 inches and 28 inches and over.

Thicknesses: ⅝ to 2 inches.

Bright sap no defect.

8-foot lengths will admit two standard defects.

18 inches wide, except 8-foot lengths, may contain five standard defects and one additional defect for each two inches of additional width.

Splits equal in length to the width of the board are admitted in not to exceed ten per cent of the boards, and are counted as a standard defect.

No. 1 Common

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 5 inches and over.

Thicknesses: Standard.

Bright sap admitted. 20% of sound discolored sap admitted on face.

No. 1 Common shall be inspected to grade according to the percentage of clear face cuttings, as shown below:

No piece or cutting to be less than 5 inches wide and 18 inches long.

The following table explains fully how the widths and lengths of boards are to grade:

Width.	Length.	Per cent.	No. of Pieces.
5 inches	8 to 14 feet	90%	2
"	15 feet and over	90%	3
6 to 7 inches	8 to 10 feet	85%	2
"	11 feet and over	85%	3
8 to 9 inches	8 to 10 feet	75%	2
"	11 to 16 feet	75%	3
"	17 feet and over	75%	4
10 to 12 inches	8 to 11 feet	70%	2
"	12 to 16 feet	70%	3
"	17 feet and over	70%	4
13 in. and over	8 to 11 feet	66 2/3%	3
"	12 to 16 feet	66 2/3%	4
"	17 ft. & over	66 2/3%	5

No. 2 Common

Lengths: 6 feet and over, admitting 15% of odd lengths 25% may be 6, 7, and 8 feet, and not to exceed 10% under 8 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

No. 2 Common shall include all lumber that will not come up to the grade of No. 1 Common and that will work at least 50% into sap or clear face cuttings. No cutting to be less than 4 inches wide and 2 feet long.

Sound discolored sap is not to be considered a defect in this grade.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

No. 3 Common must contain at least 50% sound cuttings.

No cutting to be less than 3 inches wide and 2 feet long.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects, and unsound lumber with sufficient substance to hold nails admitted.

Scoots

Scoots shall include all lumber not up to the grade of No. 4 Common.

STANDARD GRADES FOR SPECIFIC PURPOSES

Car Sign Boards

Lengths: 12 to 20 feet, admitting 15% of odd lengths; 20% may be 12 and 13 feet. 20% 14 and 15 feet, and the balance 16 to 20 feet.

Widths: 13 to 17 inches.

Thicknesses: 1, 1¼, 1½, 2, and 2½ inches.

The face side must be free from all defects except bright sap.

The reverse side of this stock must be sound and rigid, for the purpose of making a solid support for the face. Defects are allowed on the back which will not materially impair the strength of the piece.

Wagon Box Boards

Lengths: 10′ 6″, 11, 12, 13, 14, 15, and 16 feet.

Widths: 8 to 12″ and 13 to 17″.

Sound discolored sap is not a defect.

One sound knot not to exceed one inch in diameter, showing on one side only, shall

not be considered a defect in any piece or cutting.

10′ 6″ lengths shall be clear, except as above described.

11, 12, and 13-foot lengths may contain any defect that will cut off leaving the board 10′ 6″ long, as above described.

14-foot lengths are used for making one side 10′ 6″ and one end 3′ 6″, as above described, so a split is a serious defect in this length; but 10% of all 14-foot lengths in a given lot may have one split not to exceed 6 inches in length.

15 and 16-foot lengths may have any defects showing through the board, provided they will cut two pieces the same as a 14-foot board, as above described.

Shorts

Lengths: 12 to 42 inches—in multiples of 6 inches.
Widths: 3 inches and up.
Thicknesses: Standard.

No. 1

Will admit not to exceed one 6-inch split and two standard defects.

No. 2

Shall work 50% sound cutting.

Wane admitted not to exceed 3 inches in width and one-third the length of the piece on one edge or the equivalent on both edges.

This is to be used for Box Shook or cutting up purposes.

STRIPS

Strips shall be measured at the narrow end and tallied lengths separate on the half and even inches.

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 10% under 10 feet.

Widths: 2½, 3, 3½, 4, 4½, 5, 5½, and 6 inches.

Thicknesses: Standard.

No. 1 Strips shall be clear of all defects, excepting 1 inch of bright sap showing only on one face.

Select Strips will admit bright sap without limit, or, in the absence of sap, two sound knots, not to exceed ¾-inch each in diameter, or one standard defect.

No. 1 Common Strips will admit bright or sound discolored sap without limit. In addition thereto 8 to 12-foot lengths may have two standard defects; 14-foot and over, three.

No. 2 Common Strips will admit all pieces that will not come up to the grade of No. 1 Common, which can be used for cheap work without waste of more than one-third the length of any one piece. Pin-worm holes admitted.

SQUARES

Lengths: 8 feet and over, admitting 15% of odd lengths.

Sizes: 4x4, 5x5, 6x6, 7x7, 8x8, 9x9, 10x10, and 12x12.

Grades: Firsts and Seconds and No. 1 Common.

Firsts and Seconds (Fas).

Firsts and Seconds are combined as one grade.

Firsts are to be sound and free from hearts, shakes, and checks, but may have other defects, as follows:

		Standard Knots		Bright Sap on 2 edges
4″x 4″	8 to 12 ft.	1	or	2″
4″x 4″	13 ft. or longer	1	and	2″
5″x 5″	8 to 12 ft.	1	or	2″
6″x 6″	13 ft. or longer	2	and	3″
7″x 7″	8 to 12 ft.	2	or	3″
7″x 7″	13 ft. or longer	2	and	3″
8″x 8″	8 to 12 ft.	3	or	3″
8″x 8″	13 ft. or longer	3	and	3″
9″x 9″	8 to 12 ft.	4	or	3″
9″x 9″	13 ft. or longer	4	and	3″
10″x10″	8 to 12 ft.	5	or	4″
12″x12″	13 ft. or longer	5	and	4″

Seconds will admit all knots, as described in Firsts, but bright sap will be admitted without limit.

No. 1 Common

No. 1 Common Squares will include all Squares not up to the grade of Firsts and Seconds, that will cut two-thirds their length clear in pieces that can be used for newells and short turnings not less than 3 feet long, or will admit of stained sap without limit, if they have no more defects than would go in a Second, or will admit of season checks running full lengh on two sides.

QUARTERED POPLAR

Defects in this kind of Poplar differ from those in plain sawed, and consist largely of spike knots and open gum spots.

Bright sap no defect.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 10% under 10 feet.

Widths: 5 inches and over.

Thicknesses: Standard.

5 inches must be clear.

6 to 7 inches, 8 to 12 feet long, will admit two knots showing 1-inch space on edge, or one defect condensed not exceeding a 2-inch space.

6 to 7 inches, 14 feet and longer, will admit three knots showing 1-inch space on edge, or one or two defects condensed not exceeding 3 inches in space.

8 to 9 inches, 8 to 12 feet long, will admit two knots showing 1½ inches space on edge, or one defect condensed not exceeding 3 inches in space.

8 to 9 inches, 14 feet long and longer, will admit three knots 1½ inches in space on edge, or one or two defects condensed not exceeding the same.

10 inches and wider, 8 to 12 feet long, will admit two knots 2 inches in space on edge, or one defect condensed not exceeding the same.

10 inches and wider, 14 feet and longer, will admit three knots 2 inches in space on edge, or one or two defects condensed not exceeding the same.

No. 1 Common

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 10% under 10 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

Bright sap no defect.

No. 1 Common shall be inspected to grade according to the percentage of clear face quartered cuttings as shown below.

No piece or cutting to be less than 4 inches wide and 18 inches long.

The following table explains fully how the widths and lengths of boards are to grade:

Width.	Length.	Per cent.	No. Pcs.
4 inches	8 to 12′	85	2
"	13 to 20′	85	3
5 to 6"	8 to 10′	80	2
"	11 to 14′	80	3
"	15 and 16′	80	4
"	17 to 20′	80	5
7 to 8"	8 to 12′	70	3
"	13 to 16′	70	4
"	17 to 20′	70	5
9" and wider	8 to 12′	66 2/3	3
"	13 to 16′	66 2/3	4
"	17 and 18′	66 2/3	5
"	19 and 20′	66 2/3	6

No. 2 Common

Lengths: 6 feet and over, admitting 10% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 10% under 8 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

Bright or slightly discolored sap no defect.

No. 2 Common shall include all lumber that will not come up to the grade of No. 1 Common that will work at least 50% into clear face quartered cuttings. No piece or cutting to be less than 3 inches wide and 2 feet long.

POPLAR, DRESSED OR WORKED

General Instructions.

1. Dressed Poplar shall be inspected from the best or face side. The reverse side may contain defective dressing, but no other defects that would not go in the grade.

2. Slightly chipped grain on face side admitted, provided it does not exceed 6 inches square in Firsts and Seconds, 12 inches square in Saps and Selects, and 18 inches square in No. 1 Common in the aggregate.

3. Imperfect manufacture in dressed or worked stock, such as torn grain, broken knots, mismatched, insufficient tongue or groove, shall be considered defects and will reduce the grade accordingly.

4. Partition, Ceiling, Flooring or Drop Siding, having less than three-sixteenths of an inch tongue, shall not be admitted in any grade above No. 2 Common.

5. Wane on the reverse side, not exceeding one-third the width, and running not to exceed one-sixth the length of any piece, provided the wane does not extend into the tongue, or over one-half the thickness below the groove, will be admitted.

Bevel Siding

Bevel Siding is made from 1x4, 5, and 6-inch strips, S. 4 S. to 27/32x3⅜, 4⅜, and 5⅜ inches and resawed on a bevel.

No. 1. Lengths: 6 to 20 feet, admitting 15% of odd lengths. Must be practically free of defects except 1 inch of sap or two knots on thin edge that will cover by lap.

Selects. Lengths: 6 to 20 feet, admitting 15% of odd lengths. Will admit two sound knots ¾" in diameter, or one standard defect. Sap admitted without limit.

No. 1 Common. Lengths: 4 to 20 feet, admitting 15% of odd lengths. Sound discolored sap and scattering pin-worm holes not to be considered defects in this grade. In addition thereto boards may contain standard defects or their equivalent as follows:

4-foot lengths, one.
5 to 9-foot lengths, two.
10 to 14-foot lengths, three.
15 to 20-foot lengths, four.

No. 2 Common. Lengths: 4 to 20 feet, admitting 15% of odd lengths. Will admit all pieces that will not come up to the grade of No. 1 Common which can be used for cheap siding without waste of more than one-third the length of any piece. Pin-worm holes admitted.

Drop Siding

Made from 1x4, 5, and 6-inch strips.
Widths: 3¼, 4¼, 5¼ inches net face, counted as 4, 5, and 6-inch respectively.
Thicknesses: ¾ inch net after surfacing.
The above covers all grades.
No. 1. Lengths: 6 to 20 feet, admitting 15% of odd lengths. Must be practically free of defects on face side.
Selects. Lengths: 6 to 20 feet, admitting 15% of odd lengths. Will admit two sound knots ¾" in diameter, or one standard defect. Sap admitted without limit.
No. 1 Common. Lengths: 4 to 20 feet, admitting 15% of odd lengths. Sound discolored sap and scattering pin-worm holes not to be considered defects in this grade. In addition thereto boards may contain standard defects or their equivalent as follows:

4-foot lengths, one.
5 to 9-foot lengths, two.
10 to 14-foot lengths, three.
15 to 20-foot lengths, four.

No. 2 Common. Lengths: 4 to 20 feet, admitting 15% of odd lengths. Will admit all pieces that will not come up to the grade of No. 1 Common which can be used for cheap siding without waste of more than one-third the length of any one piece. Pin-worm holes admitted.

Dressed Dimension Strips

Widths, 3 inches and over; stock S. 2 S. ¼ inch scant in width; stock S. 4 S. ½ inch scant in width.
Thicknesses: Standard.
No. 1 Dimension: Lengths, 6 to 20 feet, admitting 15% of odd lengths. Each piece must be practically clear on one face, 7 to 9" widths, 1" of bright sap admitted on one edge showing on face side, 10 to 12" widths 1½" of bright sap admitted on one edge showing on face side.
Select dimension: Lengths, 6 to 20 feet, admitting 15% of odd lengths. Bright sap admitted without limit, and in addition thereto one standard defect or its equivalent admitted in boards 8" and under wide, and two standard defects or their equivalent admitted in boards 9 to 12" inclusive.
No. 1 Common Dimensions: Lengths, 4 to 20 feet, admitting 15% of odd lengths. Shall admit of any number of sound knots that paint will cover, the board to work full length and width. Bright or sound discolored sap and scattered pin-worm holes not to be considered defects in this grade.
No. 2 Common Dimension: Lengths, 4 to 20 feet, admitting 15% of odd lengths. Shall include all boards that will work two-thirds or more of the same grade as No. 1 Common, in not to exceed three cuts the full width of the boards, no cutting to be shorter than 3 feet.

Casing and Base

Lengths: 8 feet and over, admitting 15% of odd lengths.
Widths: Net, 3½, 4½, 5½, 6½, 7½, 8½, and 9½ inches, counted ½ inch wider than net face
Thicknesses: 13/16 inch after surfacing.
The above refers to and covers all grades.
Firsts and Seconds. Each piece must be practically clear on face side.
7 to 10-inch widths, 1 inch of bright sap admitted on one edge, showing on face side.
Saps and Selects. Bright sap admitted without limit, and in addition one standard defect or its equivalent to be admitted in boards 8" and under, and two standard defects or their equivalent in boards 9 to 10" wide.
No. 1 Common. This grade will include all stock that will not come up to the grade of Saps and Selects, that will work two-thirds of its length clear face in pieces 3 feet long and longer, regardless of sap. Stained sap without limit, where there are no other defects, admitted in this grade.

Flooring and Ceiling.

Widths: 2¼, 3¼, 4¼, and 5¼ inches net face, counted as 3, 4, 5, and 6 inches, respectively.
Stock finished on the one-half inch shall be counted three-quarter inch wider than net face.
Thicknesses: Flooring 13/16" after surfacing. Ceiling 5/16" counted as ⅜", 7/16"

counted as ½", 9/16" counted as ⅝", and 11/16" counted as ¾".

The above covers all grades.

No. 1. Lengths: 8 to 20 feet, admitting 15% of odd lengths. Must be practically free from defects on face side.

Selects. Lengths: 6 to 20 feet, admitting 15% of odd lengths. Bright sap without limit or in the absence of sap two sound knots not to exceed ¾ inch in diameter or one standard defect.

No. 1 Common. Lengths: 4 to 20 feet admitting 15% of odd lengths. Bright or sound discolored sap and scattering pin-worm holes not to be considered defects in this grade. In addition thereto boards may contain the following standard defects or their equivalent:

4-foot lengths, one.
6 to 10-foot lengths, two.
12 to 14-foot lengths, three.
16 to 20-foot lengths, four.

No. 2 Common. Lengths: 4 to 20 feet admitting 15% of odd lengths.

Will admit all pieces that will not come up to the grade of No. 1 Common which can be used for cheap work without waste of more than one-third the length of any one piece. Pin-worm holes admitted.

Partition.

The rules for Flooring and Ceiling shall apply, except that the reverse side of the piece must not be of a lower grade than the face.

Mouldings

No. 1

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% of 8, 9, and 10 feet, with not to exceed 10% under 10 feet.

Widths, thickness, and pattern to be governed by Universal Moulding Book, and to be graded as follows:

Bright sap or slightly discolored sap shall be admitted without limit otherwise clear, except slightly chipped grain not to exceed one-twelfth the length of any one piece.

No. 2

Lengths: 6 feet and over, admitting 15% of odd lengths; 20% of 6, 7, and 8 feet, with not to exceed 10% under 8 feet.

Widths, thickness and pattern to be governed by Universal Moulding Book, and to be graded as follows:

No. 2 will include all moulding that will not come up to the grade of No. 1 that will work 50% clear in pieces 4 feet and longer. Sound discolored sap is no defect.

PLAIN SAWED OAK, RED OR WHITE

General Instructions and the following rules are to govern the inspection.

Standard Grades: Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, No. 4 Common.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9 and 10 feet, and not to exceed 5% under 10 feet.

Widths: 6 inches and over.

Thicknesses: Standard.

Firsts shall be 6 inches and over wide, 10 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, none.
8 inches and over wide, one.

Seconds are 6 inches and over wide, 8 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, one.
8 to 10 inches wide, two.
11 to 13 inches wide, three.
14 to 16 inches wide, four.

As widths increase, defects may increase in proportion.

Splits not to exceed one-sixth the length of the piece admitted and to be considered as one standard defect and not over 20% of the whole in either quality may be so split.

Bright sap to one-third the width of the piece on the face side is no defect.

No. 1 Common

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

Bright sap is not a defect in this grade.

6-foot lengths must be clear one face, up to 8 inches wide; over 8 inches wide will admit one standard defect.

Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.
Widths: 3 inches and over.
Thicknesses: Standard.
Bright sap is no defect.
Pieces 4 feet long must be clear one face.
Pieces 5 feet and longer must work at least 50% clear face cutting.
No piece or cutting can be shorter than 18 inches nor narrower than 3 inches. and must contain 144 square inches.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.
Widths: 3 inches and over.
Thicknesses: Standard.
Each piece must work at least 50% sound cutting.
No piece or cutting can be shorter than 2 feet, nor narrower than 3 inches.
Sound discolored sap is no defect.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating etc. Worm holes are not to be considered defects, and unsound lumber with sufficient substance to hold nails admitted.

STRIPS

Strips shall be measured at the narrow end and tallied lengths separate on the half and even inches.
Bright sap is no defect.

Clear Face Strips

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.
Widths: 2, 2½, 3, 3½, 4, 4½, 5, and 5½ inches.
Thicknesses: Standard.
Each piece must show one clear face, free from all defects.

No. 1 Common Strips

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.
Widths: 2, 2½, 3, 3½, 4, 4½, 5, and 5½ inches.
Thicknesses: Standard.
This grade must work 66 2/3% clear face in not more than two pieces. No piece or cutting admitted which is less than 3 feet long and 2 inches wide.

No. 2 Common Strips

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.
Widths: 2, 2½, 3, 3½, 4, 4½, 5, and 5½ inches.
Thicknesses: Standard.
This grade must work 50% clear face. No piece or cutting to be considered less than 2 feet long and 2 inches wide.
Sound discolored sap is no defect.

SPECAL GRADES

Sound Wormy

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5 and 6 feet, and not to exceed 10% under 6 feet.
Widths: 3 inches and over.
Thicknesses: Standard.
Each piece must work at least 66 2/3% of cuttings, which shall contain no other defects except pin or spot worm holes.
No cutting allowed that is not at least 3 feet long and at least 3 inches wide.
Sound discolored sap is no defect.

Sound Wormy Strips

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.
Widths: 2, 2½, 3, 3½, 4, 4½, 5, and 5½ inches.
Thicknesses: Standard.
This grade must work at least 66 2/3% clear face cuttings, except for pin or spot worm holes.
No cutting allowed that is less than 4 feet long by the full width of the piece.
Sound discolored sap allowed.

STEP PLANK

Grades: Firsts and Seconds and No. 1 Common.
Lengths: 4 feet and over, admitting 10% of odd lengths.
Widths: 10 to 15 inches.
Thickneses: 1, 1¼, 1½, and 2 inches.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade, and must show one face and one edge free from all defects. The other side and other edge may contain sound defects that will not materially weaken the strength of the piece.

Ten feet and over long may have one split not exceeding 12 inches in length.

No. 1 Common

No. 1 Common will include all lumber not up to the grade of Firsts and Seconds, that can be used for Step Plank without waste of more than one-third of the piece.

No piece or cutting to be less than 4 feet long by the full with of the piece.

QUARTER SAWED OAK, RED OR WHITE

General Instructions and the following rules are to govern the inspecion:

Standard Grades: Fas., or Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, and No. 4 Common.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade, and must show figure covering at least 90% of the face side.

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 6 inches and over.

Thicknesses: Standard.

Firsts shall be 6 inches and over wide, 10 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, none.
8 inches and over wide, one.

Seconds are 6 inches and over wide, 8 feet and over long, and will admit standard defects as follows.

6 to 7 inches wide, one.
8 to 10 inches wide, two.
11 to 13 inches wide, three.
14 to 16 inches wide, four.

As widths increase, defects may increase in proportion.

One inch of bright sap is not a defect; each additional inch of sap to be considered as one standard defect.

Splits not to exceed one-sixth the length of the piece admitted and to be considered as one standard defect and not over 20% of the whole in either quality may be so split.

No. 1 Common

Lengths: 6 feet and over, admitting 15% of odd lengths, 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

Bright sap is not a defect in this grade.

6-foot lengths must be clear one face up to 8 inches wide; over 8 inches will admit one standard defect.

Other widths and lengths must work 66 2-3% clear figured face as follows:

Widths.	Lengths.	No. of Pieces
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

Bright sap is not a defect.

Pieces 4 feet long must be clear one face.

Pieces 5 feet and longer must work at least 50% clear face figured cutting.

No piece or cutting can be shorter than 18 inches nor narrower than 3 inches.

All cuttings must show figure on face side.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.

Widths: 3 inches and over.

Thicknesses: Standard.

Each piece must contain at least 50% sound figured cutting.

No piece or cutting can be shorter than 18 inches nor narrower than 3 inches and must contain 72 square inches.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects, and unsound lumber with sufficient substance to hold nails admitted.

STRIPS

Strips shall be measured at the narrow end and tallied lengths separate on the half and even inches.

Clear Face Strips

Must show figure covering at least 90% of the face side.

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 2, 2½, 3, 3½, 4, 4½, 5, and 5½ inches.

Thicknesses: Standard.

Each piece must show one clear quartered face free from all defects, excepting one-half inch of bright sap on 2, 2½, 3, and 3½-inch strips, and 1 inch on 4, 4½, 5, and 5½-inch strips.

No. 1 Common Strips

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7 and 8 feet, and not to exceed 5% under 8 feet.

Widths: 2, 2½, 3, 3½, 4, 4½, 5 and 5½ inches.

Thicknesses: Standard.

Bright sap is not a defect.

Each piece must work 66 2/3% clear figured face in not more than two pieces. No piece or cutting to be considered which is less than 3 feet long and 2 inches wide.

No. 2 Common Strips

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5 and 6 feet, and not to exceed 10% under 6 feet.

Widths: 2, 2½, 3, 3½, 4, 4½, 5 and 5½ inches.

Thicknesses: Standard.

This grade must work 50% clear figured face. No piece or cutting to be considered which is less than 2 feet long by 2 inches wide. Sound discolored sap is no defect.

Sound Wormy

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5 and 6 feet, and not to exceed 10% under 6 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

Each piece must work at least 66 2/3% of cuttings, which shall contain no other defects except pin or spot worm holes.

No cutting allowed that is not at least 3 feet long and at least 3 inches wide.

Sound discolored sap is no defect.

Sound Wormy Strips

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5 and 6 feet, and not to exceed 10% under 6 feet.

Widths: 2½, 3, 3½, 4, 4½, 5 and 5½ inches.

Thicknesses: Standard.

This grade must work at least 66 2/3% clear face cuttings, except for pin or spot worm holes.

No cutting allowed that is less than 4 feet long by the full width of the piece.

Sound discolored sap allowed.

SPECIAL GRADES

STEP PLANK

Grades: Firsts and Seconds and No. 1 Common.

Lengths: 4 feet and over, admitting 10% of odd lengths.

Widths: 10 to 15 inches.

Thicknesses: 1, 1¼, 1½ and 2 inches.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade and must show one face and one edge free from all defects. The other side and other edge may contain sound defects that will not materially weaken the strength of the piece.

75% of the face side must show figure.

10 feet and over long may have one split not exceeding 12 inches in length.

No. 1 Common

No. 1 Common will include all lumber not up to the grade of Firsts and Seconds, that can be used for Step Plank without waste of more than one-third of the piece.

No piece or cutting to be less than 4 feet long by the full width of the piece.

STANDARD SPECIFICATIONS FOR RAILROAD CONSTRUCTION OAK TIMBERS

GENERAL INSTRUCTIONS

Those who are not familiar with the anatomy of the oak tree should, when reading over these rules, take into consideration

that the rule describes the poorest piece that goes into the grade and that a large per cent. is above the grade described.

Definition of Oak for Construction Purposes

The term "Construction Oak" means all such products of Oak in which the strength and durability of the timber is the controlling element in its selection and use. The following is a list of products which are recommended for consideration as "Construction Oak."

Firsts are to be sound and free from heart, shakes and checks, but may have other defects as follows:

I.—CONSTRUCTION OAK

(A) Trestle and Bridge Timbers: Mud Sills, Stringers, Caps, Posts, Bracing, Bridge Ties, Guard Rails, Struts and Girts, Sash and Sway Braces.

(B) Docking and Platform Timbers: Mud Sills, Posts, Bracing, Caps, Stringers, Joists, Dock and Platform or Flooring Plank and Wales.

(C) Platform or Flooring Plank can be either square-edged or matched.

(D) Locomotive Timbers: Sills, End and Truck Timbers.

(E) Car Timbers: Car Framing, including Upper Framing, Car Sills, End and Truck Timbers, Car Decking, Inside Lining.

(F) Ties: Switch Ties, Cross Ties.

(G) Framing for Building: Mud Sills, Posts, Girders, Framing, Joists, etc.

(H) Bridge and Crossing Plank: Railroad Crossing Plank, Bridge Floor Planking.

(H½) Sheet Piling: Same as Crossing Plank, except may contain unlimited amount of heart.

(H¾) Round Piling.

(I) Cattle Guards.

(J) Track or Bumper Post.

Items A, B, C, G hereafter designated as Structural Oak.

II.—STANDARD DEFECTS

Definition of "Defect": Fault, Blemish, Mark of imperfection that will materially injure the strength.

Measurements which refer to the diameter of knots or holes shall be considered as referring to the mean or average diameter.

II.—(A) KNOTS

(1) Sound Knot. A Sound Knot is one which is solid across its face, and which is as hard as the wood surrounding it; it may be any color and contain checks.

(2) Loose Knot. A Loose Knot is one not firmly held in place by growth or position.

(3) Pith Knot. A Pith Knot is a Sound Knot with a pith hole not more than ¼" in diameter in the center.

(4) Rotten Knot. A Rotten Knot is one that is not sound and not as hard as the wood surrounding it.

(5) Pin Knot. A Pin Knot is a Sound Knot not over ¾" in diameter.

(6) Standard Knot. A Standard knot is a knot not over 2" in diameter.

(7) Large Knot. A large Knot is a Sound Knot more than 2" in diameter.

(8) Round Knot. A Round Knot is one which is oval or circular in form.

(9) Spike Knot. A Spike Knot is one sawn in lengthwise direction. The mean or the average width shall be considered in measuring this knot.

(10) Bird Peck. Bruises apparently caused by bird pecks during the growth process of the timber. Considered no defect.

II.—(B) WORM DEFECTS

(1) Pin Worm Holes. Pin Worm Holes are very small holes caused by minute insects or worms. These holes usually are not over 1/16" in diameter, or smaller, and the wood surrounding them is sound and does not show any evidence of the worm hole having any effect on the wood other than the opening.

(2) Spot Worm Defects. (Also known as Flag Worm Defects). Spot Worm Defects are caused like Pin Worm Holes by minute insects or worms working on the timber during its growth. The size of the hole is about the same as Pin Worm Holes, but the surrounding wood shows a colored spot as evidence of the defect. This spot is usually sound, and does not affect the strength of the piece.

(3) Grub Worm Holes. Grub Worm Holes are usually from about ⅛" to 3/16" in width, and vary in length from about 1" to 1¼" or 1½" and are caused by grubs working in the wood.

(4) Wooden Rafting Pin Holes. This defect sometimes appears on river timber which has been rafted and holes bored in the solid wood for tying the timber, and a solid plug or pin driven in the hole, filling it completely. These defects must be treated and considered the same as Knot Defects. Ordinary Metal, Rafting Pin or Chain Dog Hole is considered no defect.

II.—(C) SAP

Definition of "Sap": The Alburnum of a tree—the exterior part of the wood next to the bark—Sap Wood not considered a defect.

Sound Heart: The term Sound Heart is

used in these rules whenever heart of piece is split or opened and shows on outside of piece and its condition is sound and solid, not decayed. Openings between annual rings or checks not considered a defect.

II.—(D) WANE

Wane is bark or lack of wood from any cause on edges of timber.

II.—(E) SHAKES

Definition of "Shakes": Shakes are splits or checks in the timber which usually cause a separation of the wood between the annual rings.

(1) **Ring Shakes.** Ring Shakes are openings between the annual rings usually showing only on the end of timber.

(2) **Through Shakes.** Through Shakes are shakes which extend between two faces of the timber.

(3) **Checks.** A small crack in the wood due to seasoning, not considered a defect.

II.—(F) GRAIN

Crooked or Cross Grain. Crooked or Cross Grain crosses the piece within a section 24" in running length of the piece. This is only considered a defect in certain smaller sizes of dimension for specific purposes.

II.—(G) ROT

Any form of decay which may be detected as giving the timber a doty or rotten texture is a rot defect, including what is commonly known as dry rot. Water Stain, or what are sometimes scalded or burnt spots, usually caused by timber lying in the water under certain conditions before it is sawed, and burnt spots where the timber is improperly piled green, not considered defects, as they do not affect the strength of the piece.

III.—STANDARD NAMES FOR CONSTRUCTION OAK

Standard Names for Construction Oak Timber: White Oak and Red Oak. Unless specially mentioned, these terms include the following:

White Oak—
White Oak.
Chestnut or Tanbark Oak.
Burr or Mossy Cup Oak.
Rock Oak.
Post or Iron Oak.
Overcup Oak.
Live Oak.
Swamp Post Oak.
Basket or Cow Oak.
Yellow or Chinquapin Oak.

Red Oak—
Red Oak.
Pin Oak.
Black Oak.
Water Oak.
Willow Oak.
Spanish Oak.
Scarlet Oak.
Turkey Oak.
Black Jack or Barn Oak.
Shingle or Laurel Oak.

Term.—Mixed Oak means any kind of Oak.

IV.—STANDARD SPECIFICATIONS FOR STRUCTURAL OAK TIMBERS

(1) **General Requirements.** Except as noted, all Structural Timbers shall be White Oak, to be sound timber and sawed specified sizes; free from ring shakes and crooked grain, rotten knots, large knots in groups, rot, dote and wane in amounts greater than allowed in these specifications.

(2) **Boxed Hearts** are permitted in pieces of 5 x 5 square and larger. The center of the heart should be boxed as near the center of the piece as practical, and not to exceed 30%, of the pieces can have the center of the heart nearer than 1½" from any face; 20% may show one heart face, corner or edge, not to exceed 75% of the length of the piece.

IV.—(3) WANE

Explanatory:

The term 20% of the number of pieces or amount shipped refers to each item and size of each car shipped.

(a) Pieces 5x5 to 8x8 square may show 1" wane, side measurement on any two corners or edges, and this wane not to exceed more than 25% of the length of the piece singly, or 50% in aggregate. In the absence of wane on all corners excepting one, the one corner may contain wane 50% of the length of the piece as above described; not to exceed 20% of number of pieces may have this defect.

(b) Pieces over 8x8 including 12x12 square may show 1½" wane side measurement edge of any two corners or edges, and this wane not to exceed more than 33 1/3% of the length of the piece singly, or 66 2/3% in aggregate. In the absence of wane on all corners excepting one, the one corner may contain wane 66 2/3% of the length of the piece as above described not to exceed 20% of number of pieces may have this defect.

(c) Pieces over 12x12 square may show 1¾" side measurement any two corners or edges, and this wane not to extend more than 40% of the length of the piece singly, or 80% in aggregate. In the absence of wane on all corners excepting one, the one corner may contain wane 80% of the length of the piece as above described; not to exceed 20% of number of pieces may have this defect.

(d) In event that pieces have two faces as wide as above described and two faces narrower, the proportion of the amount of wane is admissible.

(e) Pieces 1" to 5" thick, not exceeding 8" wide, are governed by defect specifications above mentioned with the exception that they shall not contain wane, and not to exceed 20% of pieces 2" and thicker may show sound heart on one face; pieces under 2" thick must be free of heart. Pieces 8" and wider may contain wane as per paragraphs b and d.

(f) Rough sizes of Structural Timber shall not vary more than ¼" scant of specified size. Dressed sizes may be ½" scant after dressing.

V.—(B) LOCOMOTIVE TIMBER OAK

PASSENGER COACH DIMENSION OAK

REFRIGERATOR CAR DIMENSION OAK

Thickness cut to order, widths cut to order, lengths cut to order. Unless otherwise noted, must be cut from White Oak. This stock, wherever practical, should be cut outside the heart, and must be free of heart shake in pieces under 6x6 square. No attempt should be made to box the heart in pieces smaller than 5x7 unless heart is very small and tight. When heart is well boxed it must be firm and tight, and the center of the heart must not be nearer than 2" from any face. Must be sawed full to sizes, with square edges, and cut from sound timber, and free from worm holes, with the exception of a few small pin-worm holes well scattered, and an occasional spot worm. None of these defects, however, to affect the serviceability of the piece for the purpose intended. Must be free from split, rot or dote, large loose, rotten, or unsound knots; or, in other words, free of all defects affecting the strength and durability of the piece sound standard knots well scattered not considered a defect.

V.—(C) FREIGHT CAR TIMBERS

Freight Car Dimensions, including all cars other than Refrigerator and Passenger Cars. Sizes cut to order. Unless otherwise ordered, must be sawed from good Merchantable White or Red Oak Timber. This stock must be free from rot, shakes and splits, large, loose, rotten or unsound knots, any of which will materially impair the strength and durability of the pieces for purposes intended. This stock is intended to work full size and length without waste for Side Posts, Braces, End Sills, End Plates, Drafting Timbers, Cross Ties, etc., used in the construction of ordinary Freight or Stock Cars. On pieces 3" x 4" or equivalent girth measure and larger (nothing under 2" thick) heart check showing on one corner or side admitted on 20% of the pieces in each car shipment. Well boxed, sound hearts admitted in this material in pieces 5x6 and larger.

On pieces 3x4 to 6x6, inclusive, or equivalent girth measurement and larger (nothing under 2" thick) in absence of heart defects, wane on one corner, ¾" side measurement admitted.

Pieces over 6" x 6" square may contain 1" wane side measurement on one corner, with other conditions same as 3x4 to 6x6 sizes.

V.—(D) TIES

(1) **Switch Ties Sawed.** Thickness cut to order; widths cut to order lengths cut to order; unless noted to be White Oak. Must contain three solid sides. One face or one corner (not both) may show sound heart. Large sound knots, pin, spot, or an occasional grub worm hole not considered a defect. Sizes may vary ½" from specified sizes.

(2) **Cross Ties Sawed.** Specifications same as Switch Ties.

V.—(E) BRIDGE, DOCK, CROSSING PLANK

Lengths, cut to order.
Widths, cut to order.
Thicknesses, cut to order.
Sizes, cut to order, probably 2", 3" and 4" thick, 6", 8", 10", and 12" wide, 12', 14', and 16' long.

This product is intended to work full one good sound face, and this face side must be square edge. Sound knots, small pin and spot worm holes no defect on face side.

Must be free from rot and shake; practically square edges, admitting 1" of wane on each edge of reverse face, running two-thirds the length. Sound hearts on one side, rafting pin holes, knot holes, or grub holes not exceeding 2" in diameter admitted.

V.—(F) SHEET PILING.

Same as V (E), except that it may contain sound heart or heart check.

V.—(G) CATTLE GUARDS.

To be governed by specifications for Construction Oak, reference IV.

V.—(H) TRACK END OR BUMPING POSTS.

To be governed by specifications for Structural Timbers, reference IV.

SUPPLEMENT

To Association Standard Grades Dated May 1st, 1913.

Rule for Sound, Square Edge Oak.

Timbers: The center of the heart should be boxed as near the center of the piece as practical, not over 20% may show heart not to exceed 75% of the length of the piece in the aggregate. Not over 20% may show wane, not exceeding one sixth of the width of the piece in the aggregate.

Surface shake extending not over one-sixth the length of the piece, worm holes, knots, splits, or other defects that do not materially impair the strength of the piece in working full length and width permitted. Ordinary season checks are no defect.

Plank: To have one sound face and two square edges on the face side, the face to be free from large unsound knots, rot or rafting pin holes, but will admit sound knots, splits, or other defects that do not materially impair the strength of the piece shall exceed in extent or damage a sound knot 2" in diameter in pieces 8" and under wide, and a sound knot 3" in diameter in pieces over 8" wide. The reverse side will admit heart and other defects that do not materially weaken the piece.

Approved by Executive Grading Commission

R. H. VANSANT, Chairman.
W. E. DE LANEY, President.

W. H. WELLER, Secretary.

Cincinnati, Ohio, June 1, 1913.

COTTONWOOD

General Instructions and the following rules are to govern the inspection.

Slightly discolored sap which will dress up sound, not necessarily bright, but not black, admitted in any grade.

Standard Grades: Panel, Wide No. 1, Wagon Box Boards, Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, No. 4 Common.

Panel

Lengths: 8 feet and over, admitting 15% of odd lengths 20% may be 8, 9, and 10 feet, and not to exceed 10% under 10 feet.

Widths: 18 to 23 inches; 24 to 27 inches, and 28 inches and over.

Thicknesses: Standard.

8-foot lengths must be clear.

75% of the total quantity must be clear of knots on both sides; the balance of the quantity may contain three defects, provided 90% of the piece can be used for panels 4 feet and longer in the full width of the board.

Splits 6 inches long in one end not to be considered a defect in any board; splits longer than 6 inches not to be admitted.

Wide No. 1

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 10% under 10 feet.

Widths: 18 to 23 inches; 24 to 27 inches, and 28 inches and over.

Thicknesses: Standard.

8-foot lengths will admit two standard defects.

10 foot lengths and over will admit three standard defects.

Splits 15 inches in length admitted in not to exceed 10% of the pieces.

Wagon Box Board

Lengths: 10′ 6″, 11, 12, 13, 14, 15, and 16 feet.

Widths: 8 to 12 inches, and 13 to 17 inches.

One sound knot not to exceed 1″ in diameter, showing on one side only, shall not be considered a defect in any piece or cutting.

10′ 6″ lengths shall be clear, except as above described.

11, 12, and 13-foot lengths may contain any defect that will cut off leaving the board 10′ 6″ long, as above described.

14-foot lengths are used for making one side 10′ 6″ and one end 3′ 6″, as above described, so a split is a serious defect in this length; but 10% of all 14-foot lengths

in a given lot may have one split not to exceed 6 inches in length.

15 and 16-foot lengths may have any defects showing through the board, provided they will cut two pieces the same as a 14-foot board, as above described.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 6 inches and over.

Thicknesses: Standard.

Standard defects are admitted as follows:

6 to 7 inches wide, one.
8 to 10 inches wide, two.
11 to 13 inches wide, three.
14 to 15 inches wide, four.
16 to 17 inches wide, five.

As widths increase defects may increase in proportion.

Splits not to exceed one-sixth the length of the piece admitted, and are to be considered as one standard defect, but not over 20% of the whole may be so split.

No. 1 Common

Lengths 6 feet and over, admitting 15% of odd lengths: 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

Pieces 6 feet long must be clear one face up to 8 inches wide; over 8 inches wide will admit one standard defect.

Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

Sound discolored sap no defect.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd lengths 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

No. 2 Common shall include all lumber that will not come up to the grade of No. 1 Common, and that will work at least 50% into sound cuttings.

No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 144 square inches.

Sound discolored sap no defect.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.

Widths: 3 inches and over.

Thicknesses: Standard.

Pieces 4 feet or over long shall work at least 25% into sound cuttings.

No piece or cutting to be considered which is less than 3 inches wide and 2 feet long.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects, and unsound lumber with sufficient substance to hold nails admitted.

SHORTS

Lengths: 12 to 42 inches—in multiples of 6 inches.

Widths: 3 inches and over.

Grades: No. 1 and No. 2.

No. 1

No. 1 will admit not to exceed one 6-inch split and two standard defects.

No. 2

No. 2 shall work 50% into sound cuttings.

Wane admitted not to exceed 3 inches in width and one-third the length of the piece on one edge, or the equivalent on both edges.

This is to be used for Box Shook or cutting up purposes.

SQUARES

No. 1 shall be practically clear of knots.

No. 2 shall admit of sound knots, stained sap, small season checks, splits not exceeding 12 inches in length, and pin-worm holes.

COTTONWOOD, DRESSED OR WORKED

General Instructions

1. Dressed Cottonwood shall be inspected from the best or face side. The reverse side may contain defective dressing, but no other defects that would not go in the grade.

2. Slightly chipped grain on the face side admitted, provided it does not exceed in the aggregate 6 inches square in Firsts and Seconds 8 to 12 inches wide; 10 inches square in Firsts and Seconds; 13 inches and wider; 12 inches square in No. 1 Common 6 to 12 inches wide, and 16 inches square in No. 1 Common 13 inches and wider.

3. Imperfect manufacture in Dressed Stock, such as torn grain, broken knots, mismatched, insufficient tongue or groove, shall be considered defects and will reduce the grade accordingly.

4. Partition, Ceiling, Flooring, or Drop Siding, having less than 3/16-inch tongue shall not be admitted in any grade above No. 3.

5. Wane on the reverse side not exceeding one-third the width, and running not to exceed one-sixth the length of any one piece, provided the wane does not extend into the tongue, or over one-half the thickness below the groove, will be admitted.

Standard Sizes of Dressed Cottonwood

Finishing: ½-inch S2S to 5/16-inch; ⅝-inch S2S to 7/16-inch; ¾-inch S2S to 9/16-inch; 1-inch S2S to 13/16-inch; 1¼-inch S2S to 1 3/32-inch; 1½-inch S2S to 1 11/32-inch; 2-inch S2S to 1¾-inch.

Partition: Dressed to 13/16-inch thick; 2¼-inch; 3¼-inch; 4¼-inch, and 5¼-inch face width.

Ceiling: ⅜-inch dressed to 5/16-inch; ½-inch dressed to 7/16-inch; ⅝-inch dressed to 9/16-inch; ¾-inch dressed to 11/16-inch —same widths as Partition.

Bevel Siding and Weatherboarding

Bevel Siding is made from 1x4-inch, 1x5-inch, and 1x6-inch strips S4S to 13/16x3⅜-inch; 13/16x4⅜-inch and 13/16x5⅜-inch, resawed on a bevel.

No. 1 Grade. Lengths: 8 to 20 feet, admitting 15% of odd lengths.

Will allow sound sap without limit, but is otherwise clear except small defects which the lap will cover.

No. 2 Grade. Lengths: 6 to 20 feet, admitting 15% of odd lengths.

May contain imperfections in working, or other defects which can be removed in two cuts without waste of more than 10% of the length of any one piece.

No. 3 Grade. Lengths: 4 to 20 feet, admitting 15% of odd lengths.

Permits all classes of defects, but must work without waste of more than one-third of the contents of any one piece.

Drop Siding and Ceiling

No. 1 Grade. Lengths: 8 to 20 feet, admitting 15% of odd lengths.

Shall be one face clear and be otherwise sound.

No. 2 Grade. Lengths: 6 to 20 feet, admitting 15% of odd lengths.

May contain imperfections in working and unsound defects which can be removed in two cuts without waste of more than 10% of the length of any one piece.

No. 3 Grade. Lengths: 4 to 20 feet, admitting 15% of odd lengths.

Permits all classes of defects, but must work without waste of more than one-third the contents of any one piece.

Partition

No. 1 Grade. Lengths: 8 to 20 feet. admitting 15% of odd lengths.

Must be clear of knots on both sides.

No. 2 Grade. Lengths: 6 to 20 feet, admitting 15% of odd lengths.

May contain imperfections in working, and other defects which can be removed in two cuts without waste of more than 10% of the length of any one piece.

No. 3 Grade. Lengths: 4 to 20 feet, admitting 15% of odd lengths.

Permits all classes of defects, but must work without waste of more than one-third of the contents of any one piece.

Mouldings

No. 1

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, with not to exceed 10% under 10 feet.

Widths, thickness, and pattern to be governed by Universal Moulding Book, and to be graded as follows:

Bright sap or slightly discolored sap shall be admitted without limit otherwise clear, except slightly chipped grain not to exceed one-twelfth the length of any one piece.

No. 2

Lengths: 6 feet and over, admitting 15% of odd lengths; 20% of 6, 7, and 8 feet, with not to exceed 10% under 8 feet.

Widths, thickness, and pattern to be governed by Universal Moulding Book, and to be graded as follows:

No. 2 will include all moulding that will not come up to the grade of No. 1 that will work 50% clear in pieces 4 feet and longer. Sound discolored sap is no defect.

GUM

General Instructions and the following rules to govern the inspection:

The standard grades are: Panel, Wide No. 1, Firsts and Seconds Red, Wagon Box Boards, Firsts and Seconds Sap, Red Common, No. 1 Common Sap, No. 2 Common, No. 3 Common, and No. 4 Common.

Thicknesses: Standard.

Panel

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 10% under 10 feet.

Widths: 18 to 23 inches, 24 to 27 inches, and 28 inches and over.

Thicknesses: Standard, 5/8 to 2 inches.

8-foot lengths must be clear.

75% of the total quantity must be clear of knots on both sides; the balance of the quantity may contain three defects, provided 90% of the piece can be used for panels 4 feet and longer, in the full width of the piece. Splits 6 inches long in one end not to be considered a defect in any board; splits longer than 6 inches not to be admitted.

In this grade bright sap or discolored sap, if sound, is not considered a defect.

Wide No. 1

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 10% under 10 feet.

Widths: 18 to 23 inches, 24 to 27 inches, and 28 inches and over.

Thicknesses: Standard, 5/8 to 2 inches.

8-foot lengths will admit two standard defects.

10-foot lengths and over will admit three standard defects.

Splits 15 inches in length admitted, in not to exceed 10% of the pieces.

In this grade bright sap or discolored sap, if sound, is not considered a defect.

Firsts and Seconds (Fas) Red

Firsts and Seconds Red are combined as one grade. This grade shall show one red face.

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 6 inches and over.

Thicknesses: Standard.

Firsts shall be 6 inches and over wide, 10 feet and over long, and free from all defects except in pieces 8 inches and over wide, which will admit one standard defect.

Seconds are 6 inches and over wide, 8 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, one.
8 to 10 inches wide, two.
11 to 13 inches wide, three.
14 to 15 inches wide, four.
16 to 17 inches wide, five.

As widths increase defects may increase in proportion.

Splits not to exceed one-sixth the length of the piece admitted, and to be considered one standard defect, and not over 20% of the whole in either quality may be so split.

Wagon Box Boards

Lengths: 10′ 6″, 11, 12, 13, 14, 15, and 16 feet.

Widths: 8 to 12″ and 13 to 17″.

Sound discolored sap is not a defect.

One sound knot not to exceed one inch in diameter, showing on one side only, shall not be considered a defect in any piece or cutting.

10′ 6″ lengths shall be clear, except as above described.

11, 12, and 13-foot lengths may contain any defect that will cut off leaving the board 10′ 6″ long, as above described.

14-foot lengths are used for making one side 10′ 6″ and one end 3′ 6″, as above described, so a split is a serious defect in this length; but 10% of all 14-foot lengths in a given lot may have one split not to exceed 6 inches in length.

15 and 16-foot lengths may have any defects showing though the board, provided they will cut two pieces the same as a 14-foot board, as above described.

Firsts and Seconds (Fas) Sap

Firsts and Seconds Sap shall grade the same as Firsts and Seconds Red, except that bright sap or discolored sap, if sound, is not to be considered a defect in this grade.

Red Common

In this grade all cuttings shall show one red face.

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

Pieces 6 feet long must be clear one face up to 8 inches wide; over 8 inches will admit one standard defect.

Other widths and lengths must work at least 66 2/3% clear face, as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 1 Common Sap

No. 1 Common Sap shall grade the same as Red Common, except that sound sap, regardless of discoloration, shall not be considered a defect in this grade.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd length; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.

Widths: 3 inches and over.

No. 2 Common shall include all lumber that will not come up to the grade of No. 1 Common Sap, and that will work at least 50% into sound cuttings. No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 144 square inches. Black sap not to be considered a defect in this grade.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.

Widths: 3 inches and over.

No. 3 Common must contain at least 25% sound cutting. No piece or cutting to be considered which is less than 3 inches wide and 2 feet long.

Black sap is not to be considered a defect in this grade.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects and unsound lumber with sufficient substance to hold nails admitted.

SHORTS

Lengths: 12 inches and up to 42 inches —in multiples of 6 inches.

Widths: 3 inches and over.

No. 1

No. 1 will admit not to exceed one 6-inch split and two standard defects. In this grade edges must be square.

No. 2

No. 2 shall work 50% sound cutting. Wane admitted not to exceed 3 inches in width and one-third the length of the piece on one edge or the equivalent on both edges.

This is to be used for Box Shook or cutting-up purposes.

QUARTER SAWED GUM

Grades: Firsts and Seconds, No. 1 Common and No. 2 Common.

Widths: 5 inches and over.

Thicknesses: Standard.

Discolored sap, if sound, admitted.

No figure required.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 5 inches and over.

5 inches must be clear.

Firsts shall be 6 inches and over wide, 10 feet and over long, and free from all defects, except pieces 8 inches and over wide, which will admit one standard defect.

Seconds are 5 inches and over wide, 8 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, one.
8 to 10 inches wide, two.
11 to 13 inches wide, three.
14 to 15 inches wide, four.
16 to 17 inches wide, five.

As widths increase, defects may increase in proportion.

Splits not to exceed one-sixth the length of the piece admitted, and to be considered one standard defect, and not over 20% of the whole in either quality may be so split.

No. 1 Common

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 4 inches and over.

Pieces 6 feet long must be clear one face up to 8 inches wide; over 8 inches will admit one standard defect.

Other widths and lengths must work at least 66 2/3% clear quartered face, as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.

Widths: 3 inches and over.

No. 2 Common shall include all lumber that will not come up to the grade of No. 1 Common that will work at least 50% into sound quartered cuttings. No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 144 square inches.

Black sap not to be considered a defect in this grade.

GUM, DRESSED OR WORKED

General Instructions

1. Dressed Gum shall be inspected from the best or face side. The reverse side may contain defective dressing, but no other defects that would not go in the grade.

2. Slightly chipped grain on the face side admitted, provided it does not exceed in the aggregate 6 inches square in Firsts and Seconds 8 to 12 inches wide; 10 inches square in Firsts and Seconds 13 inches and wider; 12 inches square in No. 1 Common 6 to 12 inches wide and 16 inches square in No. 1 Common 13 inches and wider.

3. Imperfect manufacture in dressed stock, such as torn grain, broken knots, mismatched, insufficient tongue or groove, shall be considered defects and will reduce the grade accordingly.

4. Partition, ceiling, flooring, or drop siding, having less than three-sixteenth inch tongue, shall not be admitted in any grade above No. 3.

5. Wane on the reverse side not exceeding one-third the width and running not to exceed one-sixth the length of any one piece, provided the wane does not extend into the tongue, or over one-half the thickness below the groove, will be admitted.

Standard Sizes of Dressed Gum

Finishing. ½-inch S2S, 5/16-inch; ⅝-inch S2S, 7/16-inch; ¾-inch S2S, 9/16; 1-inch S2S, 13/16-inch; 1¼-inch S2S, 1 3/32 inches; 1½ inches S2S, 1 11/32 inches; 2 inches S2S, 1¾ inches.

Casing and Base. Dressed to 13/16-inch thick; 3½, 4½, 5½, 6½, 7½, 8½, 9½, and 11½ inch wide.

Flooring and Partition. Dressed to 13/16-inch thick; 2¼, 3¼, 4¼, and 5¼ inches face width.

Flooring to be S. 2 S. and center matched.

Ceiling. ⅜-inch dressed to 5/16-inch; ½-inch to 7/16-inch; ⅝-inch to 9/16-inch; ¾-inch to 11/16-inch; same widths as partitions.

Bevel Siding and Weatherboarding

No. 1 Grade. Lengths: 8 to 20 feet, admitting 15% of odd lengths.

Shall be clear one face and otherwise sound. Sound sap without limit admitted.

No. 2 Grade. Lengths: 6 to 20 feet, admitting 15% of odd lengths.

May contain imperfections in working and unsound defects which can be removed in two cuts without waste of more than 10% of the length of any one piece.

No. 3 Grade. Lengths: 4 to 20 feet, admitting 15% of odd lengths.

Permits all classes of defects, but must work without waste of more than one-third of the length of any one piece.

Drop Siding, Flooring and Ceiling

No. 1 Grade. Lengths: 8 to 20 feet, admitting 15% of odd lengths.

Will allow sound sap without limit, but is otherwise without defects.

No. 2 Grade. Lengths: 6 to 20 feet, admitting 15% of odd lengths.

May contain imperfections in working and unsound defects which can be removed in two cuts without waste of more than 10% of the length of any one piece.

No. 3 Grade. Lengths: 4 to 20 feet, admitting 15% of odd lengths.

Permits all classes of defects, but must work without waste of more than one-third of the contents of any one piece.

Partition

No. 1 Grade. Lengths: 8 to 20 feet, admitting 15% of odd lengths.

Will admit sound sap without limit, but shall be otherwise clear both sides.

No. 2 Grade. Lengths: 6 to 20 feet, admitting 15% of odd lengths.

May contain imperfections in working and other defects which can be removed in two cuts without waste of more than 10% of the length of any one piece.

No. 3 Grade. Lengths: 4 to 20 feet, admitting 15% of odd lengths.

Permits all classes of defects, but must work without waste of more than one-third of the contents of any one piece.

Finish

No. 1 Finish. Pieces 6 to 7 inches wide are clear; pieces 8 to 10 inches may have one standard defect; pieces 10 to 12 inches two standard defects; pieces 13 inches or over may have three standard defects or their equivalent in larger defects. (Sound sap is not to be considered a defect.)

No. 2 Finish. Pieces are caluculated to work 75% clear in not over 3 pieces. Discolored sap, unless of an unsound nature, and small pin worm holes, are not considered defects.

Mouldings

No. 1

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% of 8, 9, and 10 feet, with not to exceed 10% under 10 feet.

Widths, thickness, and pattern to be governed by Universal Moulding Book, and to be graded as follows:

Discolored sap, if sound, shall be admitted without limit; otherwise clear, except slightly chipped grain not to exceed one-twelfth the length of any one piece.

No. 2

Lengths: 6 feet and over, admitting 15% of odd lengths; 20% of 6, 7, and 8 feet, with not to exceed 10% under 8 feet.

Widths, thickness and pattern to be governed by Universal Moulding Book, and to be graded as follows:

No. 2 will include all moulding that will not come up to the grade of No. 1 that will work 50% clear in pieces 4 feet and longer.

BLACK GUM

Black Gum is to be inspected according to the Rules of Tupelo Gum. See Southern Cypress Mfrs. Asso. rules.

BROWN AND WHITE ASH

General Instructions and the following rules are to govern the inspection:

Bright sap is no defect in any grade.

Standard grades: Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, No. 4 Common.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 6 inches and over.

Thicknesses: Standard.

Firsts shall be 6 inches and over wide, 10 feet and over long, and will admit standard defects as follows:

6 and 7 inches wide, none.

8 inches and over, one.

Seconds are 6 inches and over wide, 8 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, one.

8 to 10 inches wide, two.

11 to 13 inches wide, three.

14 to 16 inches wide, four.

As widths increase, defects may increase in proportion.

Splits not to exceed one-sixth the length of the piece admitted and to be considered as one standard defect and not over 20% of the whole in either quality may be so split.

No. 1 Common

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 4 inches and over.
Thicknesses: Standard.
6-foot lengths must be clear one face up to 8 inches wide; over 8 inches wide will admit one standard defect.
Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd lengths 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.
Widths: 3 inches and over.
Thicknesses: Standard.
Pieces 4 feet long must be clear.
Pieces 5 feet and longer must work at least 50% clear face cutting.
No piece or cutting can be shorter than 18 inches nor narrower than 3 inches and must contain 144 square inches.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.
Widths: 3 inches and over.
Thicknesses: Standard.
Each piece must contain at least 50% sound cutting.
No piece or cutting can be shorter than 18 inches nor narrower than 3 inches and must contain 72 square inches.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects, and unsound lumber with sufficient substance to hold nails admitted.

STRIPS

Strips shall be measured at the narrow end and tallied lengths separate on the half and even inches.

Clear Face Strips

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.
Widths: 2½, 3, 3½, 4, 4½, 5, and 5½ inches.
Thicknesses: Standard.
Each piece must show one clear face free from all defects except bright sap.

No. 1 Common Strips

Lengths: 6 feet and over, admitting 15% of odd lengths 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.
Widths: 2½, 3, 3½, 4, 4½, 5, and 5½ inches.
This grade must work 66 2/3% clear face in not more than two pieces. No piece or cutting must be considered which is less than 4 feet long and the full width of the piece.

CHESTNUT

General Instructions and the following rules to govern the inspection.
Bright sap is no defect in any grade.
Worm holes that are bunched so that they will not exceed in damage the number of standard defects allowed in the piece will be admitted and to be considered as defects.
Standard Grades: Firsts and Seconds, No. 1 Common, Firsts and Seconds Wormy, No. 1 Common Wormy, Sound Wormy, No. 2 Common Wormy and No. 3 Common.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.
Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.
Widths: 6 inches and over.
Thicknesses: Standard.
Firsts shall be 6 inches and over wide, 10 feet and over long, and will admit standard defects as follows:
6 to 7 inches wide, none.
8 inches and over wide, one.
Seconds are 6 inches and over wide, 8 feet and over long, and will admit standard defects as follows:
6 to 7 inches wide, one.
8 to 10 inches wide, two.
11 to 13 inches wide, three.
14 to 16 inches wide, four.
As widths increase, defects may increase in proportion.

Splits not to exceed one-sixth the length of the piece admitted and to be considered as one standard defect, and not over 20% of the whole in either quality may be so split.

No. 1 Common

Lengths: 6 feet and over, admitting 15% of odd lengths 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

6-foot lengths must be clear one face up to 8 inches wide; over 8 inches wide will admit one standard defect.

Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

Firsts and Seconds (Fas) Wormy

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 6 inches and over.

Thicknesses: Standard.

Firsts shall be 6 inches and over wide, 8 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, none.
8 inches and over wide, one.

Seconds are 6 inches and over wide, 6 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, one.
8 to 10 inches wide, two.
11 to 12 inches wide, three.
14 to 16 inches wide, four.

As widths increase defects may increase in proportion.

Splits not to exceed one-sixth the length of the piece admitted and to be considered as one standard defect, and not over 20% of the whole in either quality may be so split.

In addition to above will admit worm holes without limit.

No. 1 Common Wormy

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7 and 8 feet, and not to exceed 5% under 8 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	6 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	6 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

In addition to above will admit worm holes without limit.

Sound Wormy

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

Will admit worm holes without limit, but must work at least 66 2/3% into sound cuttings.

No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 144 square inches.

No. 2 Common Wormy

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

Will admit worm holes without limit, but must work at least 50% into sound cuttings.

No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 144 square inches,

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.

Widths: 3 inches and over.

Thicknesses: Standard.

No. 3 Common will include all lumber that does not come up to the grade of No. 2 Common Wormy that can be used for cheap boxing, crating, sheathing, etc.

BASSWOOD

General instructions and the following rules are to govern the inspection.

Bright sap is no defect.

Standard grades: Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, No. 4 Common.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 8 feet and over admitting 15% of odd lengths 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 6 inches and over.

Thicknesses: Standard.

Firsts shall be 6 inches and over wide, 10 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, none.

8 inches and over wide, one.

Seconds are 6 inches and over wide, 8 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, one.

8 to 10 inches wide, two.

11 to 13 inches wide, three.

14 to 16 inches wide, four.

As widths increase, defects may increase in proportion.

Splits not to exceed one-sixth the length of the piece admitted and not over 20% of the whole in either quality may be so split, and to be considered as one standard defect.

No. 1 Common

Slightly discolored sap that will dress up sound, not necessarily bright, but not black, admitted.

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

6-foot lengths must be clear one face up to 8 inches wide, over 8 inches wide will admit one standard defect.

Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 2 Common

Discolored sap that will dress up sound admitted without limit.

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

Pieces 4 feet long must be clear one face.

Pieces 5 feet and over must work at least 50 per cent clear face cutting.

No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 144 square inches.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.

Widths: 3 inches and over.

Thicknesses: Standard.

Each piece must contain at least 50% sound cutting.

No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 72 square inches.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects, and unsound lumber with sufficient substance to hold nails admitted.

BUCKEYE

General instructions and the following rules are to govern the inspection.

Bright sap is no defect.

Standard grades: Firsts and Seconds, No.

1 Common, No. 2 Common, No. 3 Common, No. 4 Common.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 8 feet and over, admitting 15% of odd lengths 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 6 inches and over.

Thicknesses: Standard.

Firsts shall be 6 inches and over wide, 10 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, none.

8 inches and over wide, one.

Seconds are 6 inches and over wide, 8 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, one.

8 to 10 inches wide, two.

11 to 13 inches wide, three.

14 to 16 inches wide, four.

As widths increase, defects may increase in proportion.

Splits not to exceed one-sixth the length of the piece admitted and to be considered as one standard defect and not over 20% of the whole in either quality may be so split.

No. 1 Common

Slightly discolored sap that will dress up sound, not necessarily bright, but no black, admitted.

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

6-foot lengths must be clear one face up to 8 inches wide, over 8 inches wide will admit one standard defect.

Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 2 Common

Black sap that will dress up sound admitted without limit.

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

Pieces 4 feet long must be clear one face.

Pieces 5 feet and longer must work at least 50 per cent clear face cutting.

No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 144 square inches.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.

Widths: 3 inches and over.

Thicknesses: Standard.

Each piece must contain at least 50% sound cutting.

No piece or cutting to contain less than 72 square inches.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects, and unsound lumber with sufficient substance to hold nails admitted.

WALNUT

General Instructions and the following rules are to govern:

Lengths: 4 feet and over, admitting all odd foot lengths.

Thicknesses: Standard.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 6 feet and over, admitting 25% 8 feet and under.

Widths: 6 inches and over.

Firsts shall be 8 feet and over long.

6 and 7-inch widths must be free of defect.

8 to 12-inch widths will admit one standard defect, and 1 inch of bright sap.

13 inches and over wide will admit two standard defects and 2 inches of bright sap.

Seconds shall be 6 feet and over long.

6 and 7-inch widths will admit one standard defect and 1 inch of bright sap.

8 and 9-inch widths will admit two standard defects and 1 inch of bright sap.

10 and 11-inch widths will admit three standard defects and 1 inch of bright sap, or two standard defects and 1½ inches of bright sap, or 2½ inches of bright sap.

12 to 14-inch widths will admit three standard defects and 1½ inches of bright sap, or two standard defects and 2 inches of bright sap, or 3 inches of bright sap.

15 inches and over will admit four standard defects and 2 inches of bright sap, or three standard defects and 2½ inches of bright sap, or 4 inches of bright sap.

Splits not exceeding one-sixth the length of the piece admitted, and considered as one standard defect. Split boards limited to 20%.

Must be graded from the best side.

The poorest side must not grade lower than No. 1 Common.

No. 1 Common

Lengths: 4 feet and over. 20% 7 feet and under admitted.

Widths: 4 inches and over.

Must work 66 2/3% clear black face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	4 to 7 feet	2
4 to 11 inches	8 to 10 feet	3
4 to 11 inches	11 feet and over	4
12 inches and over	4 to 7 feet	3
12 inches and over	8 to 10 feet	4
12 inches and over	11 feet and over	5

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 2 Common

Lengths: 4 feet and over.

Widths: 3 inches and over.

Admits all lumber not up to the grade of No. 1 Common that will cut 33 1/3% clear black face in pieces containing 72 or more square inches.

No. 3 Common

Lengths: 4 feet and over.

Widths: 3 inches and over.

Each piece must contain at least 33 1/3% sound cutting in pieces not less than 72 square inches.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects, and unsound lumber with sufficient substance to hold nails admitted.

CHERRY

General Instructions and the following rules are to govern:

Standard grades: Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, No. 4 Common.

Lengths: 4 feet and over, admitting all odd lengths.

Thicknesses: Standard.

Open Gum Spots or open streaks are a defect, and two of same shall be considered equivalent to one standard defect.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 6 feet and over, admitting 25% 8 feet and under.

Widths: 6 inches and over.

Firsts shall be 8 feet and over long.

6 and 7-inch widths must be free from defects.

8 to 12-inch widths will admit one standard defect, and 1 inch of bright sap.

13 inches and over wide will admit two standard defects and 2 inches of bright sap.

Seconds shall be 6 feet and over long.

6 and 7-inch widths will admit one standard defect and 1 inch of bright sap.

8 and 9-inch widths will admit two standard defects and 1 inch of bright sap.

10 and 11-inch widths will admit three standard defects and 1 inch of bright sap, or two standard defects and 1½ inches of bright sap, or 2½ inches of bright sap.

12 to 14-inch widths will admit three standard defects and 1½ inches of bright sap, or two standard defects and 2 inches of bright sap, or 3 inches of bright sap.

15 inches and over will admit four standard defects and 2 inches of bright sap, or three standard defects and 2½ inches of bright sap, or 4 inches of bright sap.

Splits over 6 inches long, not exceeding one-sixth the length of the piece admitted, considered as one standard defect. Split boards limited to 20%.

Must be graded from the best side.

The poorest side must not grade lower than No. 1 Common.

No. 1 Common

Lengths: 4 feet and over. 20% 7 feet and under admitted.

Widths: 4 inches and over.

Must work 66 2/3% clear face, as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	4 to 7 feet	2
4 to 11 inches	8 to 10 feet	3
4 to 11 inches	11 feet and over	4
12 inches and over	4 to 7 feet	3
12 inches and over	8 to 10 feet	4
12 inches and over	11 feet and over	5

No cutting to be less than 4 inches wide and 18 inches long.

No. 2 Common

Lengths: 4 feet and over.

Widths: 3 inches and over.

Admits all lumber not up to the grade of No. 1 Common that will work 33 1/3% clear face in pieces not less than 3 inches wide and 18 inches long.

Gum spots or streaks no defect in this grade.

No. 3 Common

Lengths: 4 feet and over.

Widths: 3 inches and over.

Each piece must contain at least 33 1/3% sound cutting in pieces not less than 3 inches wide and 18 inches long.

Gum Spots or streaks no defect in this grade.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects, and unsound lumber with sufficient substance to hold nails admitted.

HICKORY AND PECAN

General Instructions and the following rules are to govern the inspection:

Standard Grades: Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, and No. 4 Common.

Bright sap is considered no defect in any grade.

Bird Peck and Gum streak are to be considered.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 8 feet and over, admitting 15% of odd lengths; 25% may be 8, 9, and 10 feet, and not to exceed 10% under 10 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

Firsts shall be 6 inches and over wide, 10 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, none.
8 inches and over wide, one.

Seconds are 4 inches and over wide, 8 feet and over long, and will admit standard defects as follows:

4 to 5 inches wide, none.
6 to 7 inches wide, one.
8 to 10 inches wide, two.
11 to 13 inches wide, three.
14 to 16 inches wide, four.

As widths increase, defects may increase in proportion.

Splits not exceeding one-sixth the length of the piece are to be admitted and considered as one standard defect; not over 20% of the whole may be so split.

No. 1 Common

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7 and 8 feet, and not to exceed 10% under 8 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

Pieces 3 inches wide must be clear.

6-foot lengths must be clear one face up to 8 inches wide; over 8 inches will admit one standard defect.

Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

Pieces 4 feet long must be clear one face.
Pieces 5 feet and longer must work at least 50% clear face cutting.
No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 144 square inches.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.
Widths: 3 inches and over.
Thicknesses: Standard.
Each piece must contain at least 50% sound cutting.
No piece or cutting can be shorter than 18 inches nor narrower than 3 inches and must contain 72 square inches.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects, and unsound lumber with sufficient substance to hold nails admitted.

PLAIN SAWED SYCAMORE

General Instructions and the following rules are to govern the inspection:
Standard Grades: Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, and No. 4 Common.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.
Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.
Widths: 6 inches and over.
Thicknesses: Standard.
Firsts shall be 6 inches and over wide, 10 feet and over long, and will admit standard defects as follows:
6 and 7 inches wide, none.
8 inches and over wide, one.
Seconds are 6 inches and over wide, 8 feet and over long, and will admit standard defects as follows:
6 to 7 inches wide, one.
8 to 10 inches wide, two.
11 to 13 inches wide, three.
14 to 16 inches wide, four.
As widths increase, defects may increase in proportion.
Splits not to exceed one-sixth the length of the piece admitted and to be considered as one standard defect, and not over 20% of the whole in either quality to be so split.
Bright sap to one-third the width of the piece on the face side is no defect. The reverse side may contain sap without limit.

No. 1 Common

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.
Widths: 4 inches and over.
Thicknesses: Standard.
Bright sap is not a defect in this grade.
6-foot lengths must be clear one face up to 8 inches wide; over 8 inches wide will admit one standard defect.
Other widths and lengths must work 66 2/3% clear face, as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches, nor narrower than 4 inches.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.
Widths: 3 inches and over.
No. 2 Common shall include all lumber that will not come up to the grade of No. 1 Common Sap, and that will work at least 50% into sound cuttings. No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 144 square inches. Black sap not to be considered a defect in this grade.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.
Widths: 3 inches and over.
No. 3 Common must contain at least 25% sound cutting. No piece or cutting to be considered which is less than 3 inches wide and 2 feet long.
Black sap is not to be considered a defect in this grade.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects and unsound lumber with sufficient substance to hold nails admitted.

QUARTER SAWED SYCAMORE

General Instructions and the following rules are to govern the inspection:

Standard Grades: Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, and No. 4 Common.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 6 inches and over.

Thicknesses: Standard.

Firsts shall be 6 inches and over wide, 10 feet and over long.

6 to 7 inches wide must be free from all defects.

8 inches and over wide will admit one standard defect.

Seconds are 6 inches and over wide, 8 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, one.
8 to 10 inches wide, two.
11 to 13 inches wide, three.
14 to 16 inches wide, four.

As widths increase, defects may increase in proportion.

One inch of bright sap is not a defect; each additional inch of sap to be considered as one standard defect.

Splits not to exceed one-sixth the length of the piece admitted and to be considered as one standard defect, and not over 20% of the whole in either quality may be so split.

No. 1 Common

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 10% under 8 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

Bright sap is no defect in this grade.

6-foot lengths must be clear one face, up to 8 inches wide; over 8 inches wide will admit one standard defect.

Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

Pieces 4 feet long must be clear.

Pieces 5 feet and longer must work at least 50% clear face cutting.

No piece or cutting can be shorter than 18 inches nor narrower than 3 inches. And must contain 144 square inches.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.

Widths: 3 inches and over.

Thicknesses: Standard.

Each piece must contain at least 50% sound cutting.

No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 72 square inches.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects and unsound lumber with sufficient substance to hold nails admitted.

BUTTERNUT

General Instructions and the following rules are to govern the inspection:

Standard Grades: Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, and No. 4 Common.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.

Widths: 6 inches and over.

Thicknesses: Standard.

Firsts shall be 6 inches and over wide, 10 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, none.
8 inches and over wide, one.

Seconds are 6 inches and over wide, 8 feet

and over long, and will admit standard defects as follows:

6 to 7 inches wide, one.
8 to 10 inches wide, two.
11 to 13 inches wide, three.
14 to 16 inches wide, four.

As widths increase, defects may increase in proportion.

Splits not to exceed one-sixth the length of the piece admitted and to be considered as one standard defect, and not over 20% of the whole in either quality may be so split.

Bright sap to one-third the width of the piece on the face side is no defect. The reverse side may contain sap without limit.

No. 1 Common

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be, 6, 7, and 8 feet, and not to exceed 5% under 8 feet.

Widths: 4 inches and over.

Thicknesses: Standard.

Bright sap is not a defect in this grade.

6-foot lengths must be clear one face, up to 8 inches wide; over 8 inches wide will admit one standard defect.

Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

Pieces 4 feet long must be clear one face.

Pieces 5 feet and longer must work at least 50% clear face cutting.

No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 144 square inches.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.

Thicknesses: Standard.

Each piece must work at least 50% sound cutting.

No piece or cutting can be shorter than 18 inches nor narrower than 3 inches and must contain 72 square inches.

Sound discolored sap is no defect.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects and unsound lumber with sufficient substance to hold nails admitted.

MAPLE

General Instructions and the following rules are to govern the inspection:

Bright sap is considered no defect in any grade.

Standard Grades: Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, No. 4 Common.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.

Lengths: 8 feet and over, admitting 15% of odd lengths; 25% may be 8, 9, and 10 feet, and not to exceed 10% under 10 feet.

Widths: 6 inches and over wide.

Thicknesses: Standard.

Firsts shall be 6 inches and over wide, 10 feet and over long, and will admit standard defects as follows:

6 to 7 inches wide, none.
8 inches and over wide, one.

Seconds are 6 inches and over wide, 8 feet and over long, and will admit standard defects as follows:

6 inches wide, one.
7 to 8 inches wide, two.
9 to 12 inches wide, three.
13 to 15 inches wide, four.

As widths increase, defects may increase in proportion.

Splits not to exceed one-sixth the length of the piece admitted and to be considered as one standard defect, and not over 20% of the whole in either quality may be so split.

No. 1 Common

Lengths: 6 feet and over, admitting 15% of odd lengths; 30% may be 6, 7, and 8 feet, and not to exceed 10% under 8 feet.

Widths: 3 inches and over.

Thicknesses: Standard.

6-foot pieces will admit standard defects as follows:

3 and 4 inches wide, none.
5 to 9 inches wide, one.
10 inches and over, two.

Pieces 3 inches wide, 7 feet and over long, to be clear one face.

Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	**7 to 11 feet**	**2**
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

No piece or cutting to be considered which is less than 3 inches wide or 2 feet long.

Slightly discolored sap is no defect.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.

Widths: 3 inches and over.

No. 2 Common shall include all lumber that will not come up to the grade of No. 1 Common Sap, and that will work at least 50% into sound cuttings. No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 144 square inches. Black sap not to be considered a defect in this grade.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.

Widths: 3 inches and over.

No. 3 Common must contain at least 25% sound cutting. No piece or cutting to be considered which is less than 3 inches wide and 2 feet long.

Black sap is not to be considered a defect in this grade.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects and unsound lumber with sufficient substance to hold nails admitted.

STRIPS

Strips shall be measured at the narrowest end and tallied lengths separate on the half and even inches.

Clear Face Strips

Lengths: 8 feet and over, admitting 15% o odd lengths; 20% may be 8, 9, and 10 fee and not to exceed 5% under 10 feet.

Widths: 2½, 3, 3½, 4, 4½, 5, and 5½ inches.

Thicknesses: ⅜ to 2 inches.

Each piece must show one face and tw edges clear.

No. 1 Common Strips

Lengths: 6 feet and over, admitting 10% o odd lengths; 25% may be 6, 7, and 8 feet, an not to exceed 5% under 8 feet.

Widths: 2½, 3, 3½, 4, 4½, 5, and 5½ inches.

Thicknesses: ⅜ to 2 inches.

Bright sap is considered no defect.

Each piece must work 66 2/3% clear fac in not more than two pieces. No piece o cutting to be considered which is less than 4 feet long by the full width of the piece.

No. 2 Common Strips

Lengths: 4 feet and over, admitting 15% o odd lengths; 25% may be 4, 5, and 6 feet, an not to exceed 10% under 6 feet.

Widths: 2½, 3, 3½, 4, 4½, 5, and 5½ inches.

Thicknesses: ⅜ to 2 inches.

Each piece must work at least 50% clear face.

No piece or cutting to be less than 2 feet in length by the full width of the piece.

STEP PLANK

Grades: Firsts and Seconds and No. 1 Common.

Lengths: 4 feet and over, admitting 15% of odd lengths.

Widths: 10 to 15 inches.

Thicknesses: 1, 1¼, 1½, and 2 inches.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade, and must show one face and one edge free from all defects. The other side and other edge may contain sound defects that will not materially weaken the strength of the piece.

10 feet and over long may have one split not exceeding 12 inches in length.

No. 1 Common

No. 1 Common will include all lumber not up to the grade of Firsts and Seconds, that can be used for Step Plank without waste of more than one-third of the piece.

No piece or cutting to be less than 4 feet ng by the full width of the piece.

WHITE MAPLE

ades: No. 1 and No. 2.
No. 1 must grade the same as Firsts and econds, except that both sides and both edges ust be all White.
No. 2 must grade the same as Firsts and econds, except that one side and two edges ust be all White.

BEECH

General Instructions and the following rules re to govern the inspection:
Bright sap is considered no defect in any rade.
Standard Grades: Firsts and Seconds, No. 1 ommon, No. 2 Common, No. 3 Common, No. 4 ommon.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one rade.
Lengths: 8 feet and over, admitting 15% of id lengths; 25% may be 8, 9, and 10 feet, nd not to exceed 10% under 10 feet.
Widths: 6 inches and over wide.
Thicknesses: Standard.
Firsts shall be 6 inches and over wide, 10 eet and over long, and will admit standard efects as follows:
6 to 7 inches wide, none.
8 inches and over wide, one.
Seconds shall be 6 inches and over wide, 8 eet and over long, and will admit standard efects as follows:
6 inches wide, one.
7 to 8 inches wide, two.
9 to 12 inches wide, three.
13 to 15 inches wide, four.
As widths increase, defects may increase in roportion.
Splits not to exceed one-sixth the length of ne piece admitted and to be considered as one andard defect and not over 20% of the whole n either quality may be so split.

No. 1 Common

Lengths: 6 feet and over, admitting 15% of dd lengths; 30% may be 6, 7, and 8 feet, nd not to exceed 10% under 8 feet.
Widths: 3 inches and over.
Thicknesses: Standard.
6-foot pieces will admit standard defects s follows:
3 and 4 inches wide, none.
5 to 9 inches wide, one.
10 inches and over, two.
Pieces 3 inches wide, 7 feet and over long, o be clear one face.

Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

No piece or cutting to be considered which is less than 3 inches wide or 2 feet long.
Slightly discolored sap is no defect.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.
Widths: 3 inches and over.
Thicknesses: Standard.
Pieces 4 feet long must be clear one face.
Pieces 5 feet and longer must work at least 50% clear face cutting.
No piece or cutting to be less than 3 inches wide or 2 feet long.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.
Widths: 3 inches and over.
Thicknesses: Standard.
Each piece must contain at least 50% sound cutting.
No piece or cutting can be shorter than 18 inches nor narrower than 3 inches and must contain 72 square inches.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects, and unsound lumber with sufficient substance to hold nails admitted.

Strips

Strips shall be measured at the narrowest end, and tallied lengths separate on the even and half inches.

Clear Face Strips

Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet and not to exceed 5% under 10 feet.
Widths: 2½, 3, 3½, 4, 4½, 5, and 5½ inches.

Thicknesses: ⅝ to 2 inches.
Each piece must show one face and two edges clear.

No. 1 Common Strips

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.
Widths: 2½, 3, 3½, 4, 4½, 5, and 5½ inches.
Thicknesses: ⅝ to 2 inches.
Bright sap is considered no defect in this grade.
Each piece must work 66 2/3% clear face in not more than two pieces. No piece or cutting to be considered which is less than 4 feet long by the full width of the piece.

No. 2 Common Strips

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5, and 6 feet, and not to exceed 10% under 6 feet.
Widths: 2½, 3, 3½, 4, 4½, 5, and 5½ inches.
Thicknesses: ⅝ to 2 inches.
Each piece must work at least 50% clear face.
No piece or cutting to be less than 2 feet in length by the full width of the piece.

WHITE BEECH

Grades: No. 1 and No. 2.
No. 1 must grade the same as Firsts and Seconds, except that both sides and edges must be all White.
No. 2 must grade the same as Firsts and Seconds, except that one side and two edges must be all White.

WHITE BIRCH

General Instructions and the following rules are to govern the inspection:

Bright sap is considered no defect in any grade.
Standard Grades: Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, No. 4 Common.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.
Lengths: 8 feet and over, admitting 15% of odd lengths; 25% may be 8, 9, and 10 feet, and not to exceed 10% under 10 feet.
Widths: 6 inches and over.
Thicknesses: Standard.
Firsts shall be 6 inches and over wide, 10 feet and over long, and will admit stand defects as follows:

6 to 7 inches wide, none.
8 inches and over wide, one.

Seconds shall be 6 inches and over wi feet and over long, and will admit stand defects as follows:

6 inches wide, one.
7 to 8 inches wide, two.
9 to 12 inches wide, three.
13 to 15 inches wide, four.

As widths increase, defects may increase proportion.

Splits not to exceed one-sixth the length the piece admitted and to be considered one standard defect, and not over 20% of whole in either quality may be so split.

No. 1 Common

Lengths: 6 feet and over, admitting 15% odd lengths; 30% may be 6, 7, and 8 feet, a not to exceed 10% under 8 feet.
Widths: 3 inches and over.
Thicknesses: Standard.
6-foot pieces will admit standard defects follows:

3 and 4 inches wide, none.
5 to 9 inches wide, one.
10 inches and over wide, two.

3 inches wide, 7 feet and over long, to clear one face.
Other widths and lengths must wo 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Piec
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

No piece or cutting to be considered whi is less than 3 inches wide or 2 feet long.
Slightly discolored sap is no defect.

No. 2 Common

Lengths: 4 feet and over, admitting 15% odd lengths; 25% may be 4, 5, and 6 feet, ar not to exceed 10% under 6 feet.
Widths: 3 inches and over.
Thicknesses: Standard.
Pieces 4 feet long must be clear.
Pieces 5 feet and longer must work at leas 50% clear face cutting.
No piece or cutting to be less than 3 inche wide or 2 feet long.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.
Widths: 3 inches and over.
Thicknesses: Standard.
Each piece must contain at least 50% sound cutting.
No piece or cutting can be shorter than 18 inches nor narrower than 3 inches and must contain 72 square inches.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects, and unsound lumber with sufficient substance to hold nails admitted.

RED BIRCH

Red Birch must be graded the same as White Birch, except as follows:
Firsts and Seconds to be 5 inches and over in width.
Pieces 5 inches wide must show one face all red.
Pieces 6 inches and over wide must show at least 75% red on one face.
Lengths: 4 feet and over.

ELM

General Instructions and the following rules are to govern the inspection:
Bright sap is considered no defect in any grade.
Standard Grades: Firsts and Seconds, No. 1 Common, No. 2 Common, No. 3 Common, No. 4 Common.

Firsts and Seconds (Fas)

Firsts and Seconds are combined as one grade.
Lengths: 8 feet and over, admitting 15% of odd lengths; 20% may be 8, 9, and 10 feet, and not to exceed 5% under 10 feet.
Widths: 6 inches and over.
Thicknesses: Standard.
Firsts shall be 6 inches and over wide, 10 feet and over long, and will admit standard defects as follows:
6 to 7 inches wide, none.
8 inches and over wide, one.
Seconds are 6 inches and over wide, 8 feet and over long, and will admit standard defects as follows:
6 to 7 inches wide, one.
8 to 10 inches wide, two.
11 to 13 inches wide, three.
14 to 16 inches wide, four.

As widths increase, defects may increase in proportion.
Splits not to exceed one-sixth the length of the piece admitted and to be considered as one standard defect and not over 20% of the whole in either quality may be so split.

No. 1 Common

Lengths: 6 feet and over, admitting 15% of odd lengths; 25% may be 6, 7, and 8 feet, and not to exceed 5% under 8 feet.
Widths: 4 inches and over.
6-foot lengths must be clear one face up to 8 inches wide; over 8 inches wide will admit one standard defect.
Other widths and lengths must work 66 2/3% clear face as follows:

Widths.	Lengths.	No. of Pieces.
4 to 11 inches	7 to 11 feet	2
4 to 11 inches	12 to 16 feet	3
4 to 11 inches	17 to 20 feet	4
12 to 15 inches	7 to 11 feet	3
12 to 15 inches	12 to 16 feet	4
12 to 15 inches	17 to 20 feet	5
16 inches and over	7 to 11 feet	4
16 inches and over	12 to 16 feet	5
16 inches and over	17 to 20 feet	6

The smallest cutting allowed must contain 144 square inches, and it must not be shorter than 18 inches nor narrower than 4 inches.

No. 2 Common

Lengths: 4 feet and over, admitting 15% of odd lengths; 25% may be 4, 5 and 6 feet, and not to exceed 10% under 6 feet.
Widths: 3 inches and over.
No. 2 Common shall include all lumber that will not come up to the grade of No. 1 Common Sap, and that will work at least 50% into sound cutting. No piece or cutting can be shorter than 18 inches nor narrower than 3 inches, and must contain 144 square inches. Black sap not to be considered a defect in this grade.

No. 3 Common

Lengths: 4 feet and over, admitting 15% of odd lengths.
Widths: 3 inches and over.
No. 3 Common must contain at least 25% sound cutting. No piece or cutting to be considered which is less than 3 inches wide and 2 feet long.
Black sap is not to be considered a defect in this grade.

No. 4 Common

No. 4 Common shall include all lumber not up to the grade of No. 3 Common that can

be used for cheap boxing, sheathing, crating, etc. Worm holes are not to be considered defects and unsound lumber with sufficient substance to hold nails admitted.

VEHICLE AND WAGON STOCK

HICKORY VEHICLE WHEEL STOCK

Definition of Terms in Rules for Grading Rims

Very Dense Growth is a growth in which the non-porous part of the annual ring covers three-quarters of the area af the annual ring, and the remaining one-quarter contains a small number of pores.

A Dense Growth is one on which the non-porous portion of the annual ring occupies at least two-thirds the annual rings, and is slightly more porous than the very dense growth and accordingly that timber which contains a less per cent of non-porous growth and a larger per cent of porous growth, is representative of a lower grade of timber.

Blemishes

A blemish is that which, while marring the appearance of the timber, does not affect the strength of the timber.

(a) **Stains.** A stain is a discoloration caused by improper care or handling, by improper piling, and by being left in the weather or on the ground during the warm or wet seasons.

(b) **Iron Streaks.** An iron streak is supposed to be caused by the infiltration of foreign coloring matter through bird-pecks, and when it shows but slightly, apparently does not affect the mechanical qualities of the timber.

Bird Pecks

A bird peck is a slight defect caused by the bird pecking a hole in and through the bark of a tree into which there settles foreign substances that discolor the timber, and when showing slightly, apparently does not affect the quality of the timber.

Bastard Rim

A bastard rim is one in which the growth or annual rings do not run parallel to the thread of the wheel.

Cross Grain

A cross grain piece of timber is one in which the growth or grain of the timber does not run parallel to the center line of the piece.

Sound Knot

A sound knot is one in which the wood is as solid as the wood surrounding the knot.

Short Curve or Dip in the Grain or Growth

A short curve or dip in the grain or growth is a curvature or deflection caused by a knot.

Snarl

A snarl is a twisted grain or growth in the wood.

Grub Holes

A grub hole is a hole about one-quarter inch in diameter caused by grub worm boring a hole, usually lengthwise to the growth of the timber.

Powder Post

A powder post piece of hickory timber is caused by a very small worm that continues to work in timber after it has been cut, seasoned and even manufacturered into the finished vehicle. While his work does not frequently appear on the outside, the inside may be entirely reduced to powder—hence the term "powder-post."

Worm Holes

A worm hole is a clean, open hole about one-sixteenth inch in diameter, and is easily visible, caused by a bug usually working in partly seasoned timber.

Sun Check

A sun check is a season check caused in seasoning and usually takes place in the best quality of timber. In some instances these checks are so very small that they do not impair the use or strength of the timber, and should be used at least in the lowest grade.

RIM INSPECTION

"A" GRADE

"A" Grade is the first and highest grade. In rim-strips of sizes 1½-inch square and smaller, the timber must be all white, of very dense growth, straight grain and free from streaks, stains and all defects, in sizes larger than 1½-inch the timber may be either all white, or part red and part white mixed, of very dense growth, straight grain

and free from streaks, stains and all defects.

The red timber in these large sizes must not exceed one-half the size of the stick.

"B" GRADE

"B" Grade is the second grade and must be practically straight grain of dense growth. Of all white and of red and part white and part red timber. The red and part red and part white must be fully equal to or better in quality than the white in this grade.

All rim strips in this grade must be free from all defects.

"C" GRADE

"C" Grade is the third grade and must be medium quality of either white, red, or red and white mixed timber. This grade will admit of timber of good quality not admitted in the "A" and "B" grade on account of cross grain, and all slight blemishes such as iron streaks and stains, but that are equal in strength to the clear strips of this grade.

Cross Grain. The grain shall not run in the length of the strip at any place at a greater angle than one inch in eighteen.

Short curves or dips in grain not to be included in this grade.

"D" GRADE

"D" Grade is the fourth grade. The timber in this grade, although clear and straight grain, of white or red, or white and red mixed, is of a weight and quality not admitted in higher grades. Also strips of high quality of timber equal in strength with the straight grain strips in this grade, but with blemishes such as iron streaks and stains, and defects such as knots and bird pecks that are sound, also cross grain, provided the grain shall not run in the length of the strip at any place at a greater angle than one inch in twelve.

Short curves or dips in the grain with a length of less than four inches and more than ⅜-inch in depth will not be admitted in this grade.

Curves running longer than 4 inches and dips deeper than ⅜" would be considered cross grain.

"E" GRADE

"E" Grade is the fifth and lowest grade, consisting of strips that can be used, but such as are not admitted in the higher grades on account of quality of timber and defects. Strips with slight season checks should be used in wheels of this grade.

Strips with defects such as powder post worm eaten timber, open defects such as grub holes, checks, splits, bird pecks, snarls and otherwise unsound, and very brash timber such as has practically no fiber and strength will not be admitted to this grade.

Supplement to the Association Standard Grades, dated May 1, 1913

Cincinnati, Ohio, July 15, 1914.

The following rule for Wagon Box Boards was adopted by the Hardwood Manufacturers' Association, at Memphis, January 22, 1914, and accepted by the Farm Wagon Department of The National Implement and Vehicle Association in June, 1914. It is hereby promulgated as effective from this date, succeeding the previous rule on this stock.

J. H. HIMMELBERGER, President.
W. E. DE LANEY, Chairman of Grading Commission.
W. H. WELLER, Secretary.

WAGON BOX BOARDS

Basswood, Bay Poplar (Tupelo), Cottonwood, Gum Poplar and Magnolia

Widths: Wide, 13 to 17 inches. Narrow, 9 to 12 inches.

Lengths: 12, 14 and 16 feet, but 15% may be 11, 13, 15 feet.

Thickness: Must be 1 inch thick when shipping dry.

Defects: Must be free from defects excepting that no objection will be made to bright sap or sound discolored sap; also one sound knot, not to exceed 1¼ inches in diameter or its equivalent, showing on one face only. Eleven feet lengths to be free from splits; 12, 13 and 16 feet lengths will admit of a 12-inch split in one end or its equivalent in both ends; 14 and 15 feet lengths will admit of splits not to exceed 6 inches in one end or its equivalent in both ends.

Note.—16-foot lengths may have other defects so that the board will make one side 11 feet long and one end piece 3 feet 6 inches long.

Note—Five per cent in feet of a shipment that can be reduced in measurement by cutting the end or edge or both to a size ordered must be accepted and measured as box boards, separate tally to be kept of such boards, showing reduction in measurement.

Note.—Inspectors are cautioned that "woolly" cottonwood and lumber so warped that it cannot be used for box boards, must be excluded from this grade.

WAGON STOCK

Standard Dimensions

The following dimensions given are the sizes adopted by this Association for rough material in the green state (unless otherwise specified) and are those in common demand by our members.

The star (*) prefixing any size indicates that that size is more in demand than the unmarked sizes.

Axles—Hickory

(6 feet long.)

2¾x3¾	3¾x4¾	*4½x5½
*3 x4	*4 x5	*5 x6
*3¼x4¼	4 x5½	5½x6½
*3½x4½	4¼x5¼	6 x7

GRADING AND INSPECTION RULES

No. 1 or Wagonmakers' Grade

Adopted by the National Wagon Manufacturers' Association.

GRADE.—Live, tough black or shell bark hickory, cut 6 feet in length, to include all the clear and perfect stock.

Defects as follows admissible:

STAIN.—Penetrating not more than 1/16-inch and which has not developed into a rotting condition.

KNOTS.—Four sound pin knots not exceeding ¼-inch in diameter, or two sound knots ¾-inch in diameter near the center line longitudinally on top or side and not over 12 inches of center or more than 6 inches of ends. Knots (except pin knots) not to be closer than 12 inches apart.

SPLITS.—On either end, extending not more than 6 inches in axle or 3 inches on both ends.

SEASON CHECKS.—Not more than ½-inch deep and not more than 12 inches long.

HEARTS OR HEART RINGS.—None.

SHAKES.—That will plane out with ⅛-inch cut.

WORM HOLES AND GRUB HOLES.—Not more than two pin worm holes not nearer than 6 inches to each other.

Not more than two grub holes that will penetrate more than 6 inches at either end of the piece.

BIRD PECKS.—Bird pecks allowed if sound, or if unsound, part is not to exceed ½-inch in diameter and not over ¼-inch in depth.

WANE.—Axles with wane will be measured excluding the wane.

SAP.—Bright sap considered no defect.

GRAIN.—Grain can cross 3 inches in entire length of axle.

DEFECTS REMOVABLE.—If defects not admitted can be cut out so as to reduce axle to a smaller size used and ordered by the buyer, it shall be so inspected.

Hewn axles shall be measured to square to the size they are ordered.

Defects at end of axles that will admit of piece working 5 feet 6 inches long will be admitted.

MAPLE AXLES

(Sizes same as Hickory.)

No. 1 or Wagonmakers' Grade.

(These rules have not been adopted either by the wagon manufacturers or mills, but are suggested as being fair and equitable to both.)

To be cut from live, tough, hard maple (no birds-eye or curly maple admitted), cut 6-foot and 12-foot lengths to include all the clear and perfect stock. Defects as follows admissible:

STAIN.—Penetrating not more than 1/16-inch and which has not developed into a rotting condition.

KNOTS.—Four sound pin knots not exceeding ¼-inch in diameter, or two sound knots ¾-inch in diameter near the center line longitudinally on top or side and not over 12 inches of center or more than 6 inches of ends. Knots (except pin knots) not to be closer than 12 inches apart.

SPLITS.—Splits on either end, extending not more than 6 inches in the axle or 3 inches on both ends.

SEASON CHECKS.—Not more than ½-inch deep and not more than 12 inches long.

HEARTS OR HEART RINGS.—None.

SHAKES.—That will plane out with ⅛-inch cut.

WORM HOLES AND GRUB HOLES.—Not more than two pin worm holes not nearer than 6 inches to each other. Not more than two grub holes that will penetrate more than 6 inches at either end of the piece.

BIRD PECKS.—Bird pecks allowed if sound, or if unsound, part is not to exceed ½-inch in diameter and not over ¼-inch in depth.

WANE.—Axles with wane will be measured excluding the wane.

SAP.—Bright sap considered no defect.

GRAIN.—Grain can cross 3 inches in entire length of axle.

CURLS.—None. 12-foot lengths to be inspected as two 6-foot lengths.

DEFECTS REMOVABLE.—If defects not admitted can be cut out so as to reduce axle to smaller size used and ordered by the buyer, it shall be so inspected.

BOLSTERS—Hickory or Oak.

(Length 4' 1" and 4' 6" or multiples.)

3x4	3¼x4¼	3¾x5½
3x4½	3¼x5	4 x5
3x5	3½x4½	4 x6
3x7	3¾x4¾	

RULES

GRADE.—To be cut from good, tough, straight-grained oak or hickory (when oak is specified it will be understood as being White or Red Oak) suitable for wagon material. To be clear and perfect stock, excepting the following defects which will be admissible:

STAIN.—Penetrating not more than 1/16-inch and which shows no signs of rot.

KNOTS.—One sound knot not over ½-inch in diameter, not more than 12 inches from the center of the piece, or 3 sound pin knots not exceeding ¼-inch in diameter located in same manner.

SPLITS.—None.

SEASON CHECKS.—Not more than ½-inch deep nor more than 12 inches long.

HEART RINGS.—None.

SHAKES.—If they can be planed out with ⅛-inch cut.

WORM HOLES.—Not more than 6 pin worm holes in a Bolster, these holes not to be in cluster or more than 3 holes, 6 inches apart.

BIRD PECKS.—Allowed if sound.

WANE.—Will be measured excluding the wane.

SAP.—Bright sap accepted.

GRAIN.—Grain can cross 2 inches in length of Bolster as maximum.

DEFECTS REMOVABLE.—If defects not admitted can be cut out so as to reduce Bolster to a smaller size used and ordered by the buyer, it shall be so inspected.

SAND BOARDS—Hickory or Oak.

(Length, 4' 1" and 4' 6" or multiples.)

2¾x3½	*3 x4	3½x4½
3 x3½	3¼x3¾	*4 x5
	*3½x4	

RULES

(Same as Bolsters.)

REACHES—Hickory or Oak

*2 x4	8' and 10' long
2 x4½	8' and 10' long
2¼x4½	10', 12' and 14' long
2½x4½	10', 12' and 14' long
2½x5	10', 12' and 14' long

RULES

GRADE.—To be cut from good, tough, straight grained Oak or Hickory (when Oak is specified it will be understood as being White or Red Oak), suitable for wagon material. To be clear and perfect stock, free from KNOTS, SPLITS, HEARTS, GRUB HOLES, HEART RINGS, SHAKES, BIRD PECKS, or WANE. Bright Sap accepted. The following defects will be admitted:

STAIN.—Penetrating not more than 1/16-inch and which shows no signs of rot.

SEASON CHECKS.—Not over ¼-inch deep or 12 inches long.

WORM HOLES.—Not more than 6 pin worm holes in a Reach, these holes not to be in clusters of more than 3 holes, 6 inches apart.

POLES—Ash or Oak

(For Drop Poles.)

*2½x4 x4 x4 —12'
2½x4½x4½x4½—12'

(For Stiff Poles.)

2½x2½x2½x5 —12'
2¾x2¾x2¾x5 —12'
3 x3 x3 x5 —12'
3¼x3¼x3¼x5 —12'

RULES

GRADE.—To be cut from good, tough, straight-grained oak or ash (when oak is specified, it will be understood as being White or Red Oak), suitable for wagon material. To be clear and perfect stock, free from KNOTS, SPLITS, HEARTS, GRUB HOLES, HEART RINGS, SHAKES or BIRD PECKS. Bright Sap accepted. The following defects will be admitted:

STAIN.—Penetrating not more than 1/16-inch and which shows no signs of rot.

SEASON CHECKS.—Not over ¼-inch deep or 12 inches long.

WORM HOLES.—Not more than 6 pin worm holes in a Pole, these holes not to be in clusters of more than 3 holes, 6 inches apart.

EVENERS—Hickory

2x4	4' 2" long	2¼x4½	4' 6" long
2x4½	4' 2" long	2½x5	4' 6" long

RULES

GRADE.—To be cut from good, tough, straight-grained Hickory suitable for wagon material. To be clear and perfect stock, free from KNOTS, SPLITS, HEARTS, GRUB

HOLES, HEART RINGS, SHAKES, WORM HOLES, or WANE. The following defects are admissible:

STAIN.—Penetrating not more than 1/16-inch and which shows no signs of rot.

SEASON CHECKS.—Not over ¼-inch deep or 12 inches long.

WORM HOLES.—None.

BRIGHT SAP.—No objection.

BIRD PECKS.—Sound bird pecks admitted.

TURNED SINGLETREES

Oval Diameters

	At Center.	At Ends.	Lengths.
Light	2" x2½"	1½"x1⅝"	34" and 36"
Medium	2¼"x2¾"	1⅝"x1⅞"	34" and 36"
Heavy	2½"x3"	1¾"x2"	36"

TURNED NECK YOKES

Diameter

	At Center.	At Ends.	Lengths.
Light	2½"	1½"	40" and 44" long
Medium	2¾"	1⅞"	40", 44" and 48" long
Heavy	3 "	2 "	44" and 48" long

No adopted rules for grading single trees and neck yokes, but stock must be absolutely clear and made from young, tough hickory.

SAWED FELLOES—Oak

(26 pieces to set.)

The sizes given are for green felloes cut full.

Sizes Most Common

1¾x2½	2¾x2¾	2¾x3
*2 x2¾	3¼x2¾	3¼x3
2½x2¾	2¼x3	4½x3

Circles 2' 11" and 3' 6"; 3' 2" and 3' 10"; 3' 6" and 4' 2".

RULES

GRADE.—Sound white or red oak, free from knots and also other defects, except that 1/16-inch stain will be allowed if said stain shows no sign of rot. Must be manufactured so that grain will run straight through center of each piece. Cut full sizes and proper circles.

BENT RIMS

(8 pieces to set.)

The sizes given are for green rims.

Sizes Most Common

1¾x1¾	3 x2	4¼x2¼
2 x2	3¼x2⅛	5 x2
2½x2	4 x2	5¼x2¼

Circles 3' 2" and 3' 10"; 3' 6" and 4' 2"; 3' 10" and 4' 6".

GRADE

Wagon Manufacturers' Grade.

(To replace what was formerly XXX.)

These rules agreed upon jointly by the Wagon and Rim Manufacturers, November 21, 1906.

MATERIALS.—Oak (any desirable species).

QUALITY.—Clear and straight-grained, but not excluding reasonably straight, the grain not to cross the rim in a less distance than 24 inches to be sound, free from bark, wane, checks, (except checks on tread side), shakes, splits, knots and worm holes, but admitting not more than three small, sound knots, not more than ½-inch in diameter on tread side; also, small worm holes not closer than 6 inches apart. Not over 15 per cent of any shipment of rims shall be with knots or worm holes as above specified.

WORKMANSHIP.—Planed on top and bottom sides; no skips, tears or imperfect planing. Bending to be on the true circle of diameter specified. To be free from flats or humps, kinks, breaks or buckles, and no straight or drop ends.

WHITE OAK WAGON SPOKES

(Wagonmakers' Grades.)

RULES

Second Growth Grade

MATERIAL.—Spokes of this grade are to be made from first quality timber, practically clear and straight grained, of heavy weight and very dense growth that will indicate the very greatest strength.

Defects

CHECKS.—Small fine season checks not to exceed two inches in length and not running into the shoulder admitted.

SPLITS.—None admitted.

CROSS GRAIN.—Grain which does not run at a greater angle at any one point than one inch in twenty-four inches admitted. Curly spokes are considered cross-grained and not admitted.

KNOTS.—Spokes having knots will not be admitted, but spokes showing a small sound spot having the appearance of a knot, but which is only a surface blemish, will be admitted.

SAP.—Half Sap that is bright and sound admitted.

BASTARD.—Not more than ¾ bastard will be admitted.

OTHER DEFECTS.—Evident defects not above enumerated not admitted.

"A" GRADE

MATERIAL.—Spokes of this grade are to be made from live timber of dense growth, good weight, practically clear and straight-grained.

Defects

CHECKS.—Small, fine season checks not to exceed two inches in length and not running into the shoulder admitted.

SPLITS.—None admitted.

CROSS GRAIN.—Grain which does not run at a greater angle at any one point than one inch in twenty inches will be admitted. Spokes reduced from the second growth grade by reason of cross grain will be admitted in this grade when the grain does not cross at a greater angle than one inch in eighteen inches. Curly spokes are not admitted.

KNOTS.—Knots will not be admitted, but spokes showing a small sound spot having the appearance of a knot, but which is only a surface blemish will be admitted.

SAP.—Half Sap that is bright and sound admitted, but when of the second growth grade or very dense growth reduced by reason of having too much bright sap, will be admitted to the extent of two-thirds bright sap.

BASTARD.—Not more than half bastard will be admitted.

DIPS.—Spokes having dips not more than one in a spoke and located anywhere except at shoulder or tenon admitted, provided such dip is not more than ¼-inch in depth and not less than four inches in length.

OTHER DEFECTS.—Evident defects not above enumerated not admitted.

"B" GRADE

MATERIAL.—Spokes of this grade are to be made from timber of a weight and growth that will indicate fairly good strength.

Defects

CHECKS.—Small, fine, season checks not to exceed two inches in length and not running into the shoulder admitted.

SPLITS.—None admitted.

CROSS GRAIN.—Grain which does not run at a greater angle at any one point than one inch in sixteen inches admitted. Spokes reduced from the second growth grade because of excessive cross grain, but in which the grain does not run at a greater angle at any one point than one inch in fourteen inches, admitted.

Spokes reduced from the "A" Grade for cross grain will be admitted to this grade if grain does not run at a greater angle than one inch in fifteen inches.

KNOTS.—Knots will not be admitted, but spokes showing a small sound spot having the appearance of a knot, but which is only a surface blemish, will be admitted.

Spokes reduced from the second growth and "A" Grades having one sound knot not over ¼ inch in diameter, showing only on one side and not within five inches of either end of the spoke, admitted here.

SAP.—Half Sap that is bright and sound will be admitted.

Bright all sap spokes of second growth grade admitted.

Spokes from "A" grade having three-fourths sap admitted.

BASTARD.—Not more than half bastard will be admitted.

Spokes of second growth grade will be admitted in this grade where full bastard.

Spokes of "A" Grade will be admitted in this grade where three-fourths bastard.

DIPS.—Will be admitted in this grade where not more than one in a spoke and located anywhere except at shoulder or tenon, provided such dip is not more than ¼ inch in depth and not less than four inches in length.

WORM HOLES.—Black and pin worm holes in either second growth or "A" Grades of timber will be admitted here to the extent of not more than three in any spoke, but these must not be bunched. Powder post worm holes not admitted.

OTHER DEFECTS.—Evident defects not above numerated not admitted.

MANUFACTURE

The following suggestions are made to the manufacturers of spokes, which, if heeded, will not only result in more perfect product, but remove the cause of much dispute and dissatisfaction:

It is shown that there is a great deal of complaint on account of poorly manufactured spokes, such as tearing in the barrel by the lathe knives or by the adjustment of the knives not being in line making thick and thin places along the barrels; the grain pulled out; also, rough machine work in the throat, or on the tenon, by which the corners may be chipped off, the tenon not even thickness and not in the center of the spoke. There should also be great care taken in the facing of spokes, so that the face and the back

are square with the tenon, and not diamond shapes, as is so frequently the case. Spokes should also be well sanded with a view of having them clean and smooth.

It should also be understood that all spokes made under the foregoing rules will be branded only "Second Growth," "A" and "B" respectively, and that in no case will the spoke manufacturer brand these grades higher or lower than they will inspect under these rules nor will the wagon manufacturer request it. No restriction, however, is put upon the use of special brands.

SPECIFICATIONS FOR FINISHING OAK SPOKES FROM DRY STOCK

	WESTERN REGULAR AND WIDE POINT PATTERN			CALIFORNIA PATTERN			
Size of Spoke	Width of Tenon	Thickness of Tenon	Length of Tenon	Width of Tenon	Thickness of Tenon	Length of Tenon	Allowance for Shrinkage Half-Dry Stock
1½	1 8/16	1 1/16	1¾				3/32 f
1⅝	1 9/16	1 1/16	1⅞				3/32 f
1¾	1 13/16	¾	2				3/32 f
1⅞	1 15/16	1 3/16	2⅛				1/16
2	2 1/16	1 3/16	2¼	2 1/16	⅞	2½	1/16
2⅛	2 3/16	1 3/16	2⅜	2 3/16	1 1/16	2⅝	1/16
2¼	2 5/16	⅞	2½	2 5/16	1 1/16	2¾	1/16
2⅜	2 7/16	1 1/16	2⅝	2 7/16	1	2⅞	1/16
2½	2 9/16	1	2¾	2 9/16	1 1/16	3	1/16
2⅝	2 11/16	1 1/16	2⅞	2 11/16	1 3/16	3⅛	1/16 f
2¾	2 13/16	1⅛	3	2 13/16	1⅛	3¼	1/16 f
2⅞	2 15/16	1⅛	3⅛	2 15/16	1⅛	3⅜	1/16 f
3	3 1/16	1 3/16	3¼	3 1/16	1 3/16	3½	1/16 f
3¼	3 5/16	1¼	3⅜	3 5/16	1¼	3¾	1/16 f
3½	3 9/16	1⅜	3½	3 9/16	1⅜	4	1/16 f

TENONING.—Make the tenon even thickness throughout, and in the center of barrel and straight with the face. Dish the shoulder so that when two spokes are placed face to face about 1/8 inch apart at the shoulder and the points touching the shoulders will come to a straight line so that a common rule placed flat on the tenons, the edge of the rule should touch the shoulders all the way across both spokes.

The above specifications for thickness of tenons are for thoroughly dry stock. When half dry, add allowance given; for entirely green stock, add double this allowance.

THROATING.—Make the shoulder the same thickness as the barrel. Shape the knives to make the throat about 1/8 inch thinner than the barrel; also make the throat a little full near the shoulder to give strength and prevent splitting off in driving. Shape the forms or cams to make the throat rounding, so the face and back will not be too large, but well proportioned. The back must be proportionately wider than the face. Adjust machine to make shoulder straight (neither rounding at the corners, nor hollow in the center). Care should be taken to make both sides of the throat the same shape.

FACING OR JOINTING.—Take measurements for width of tenon at the shoulder. Face the spoke as nearly as possible to a straight line from the point end to the tenon end, and back the spoke as nearly as possible to a straight line from the point end to the shoulder. Taper the back of tenon on a straight line from the shoulder to the end, so the tenon will measure 1/16 inch less in width at the end (where it enters the hub) than at the shoulder.

The above specifications for width of tenons are for thoroughly dry stock. When half dry, add allowance given; for entirely green stock, add double this allowance.

ALLOWANCE FOR SHRINKAGE. — For spokes turned from stock from six to eight months old, and spokes turned from green stocks that have been under shed for three or four months, may be considered half dry, for which allowance is given above. For green stock, double this allowance.

SPECIFICATIONS FOR TURNING STANDARD WESTERN PATTERN and WIDE POINT CLUB SPOKES FROM DRY AND GREEN STOCK

Size of Spoke	Total Length of Head and Throat	SIZE OF HEAD		SIZE OF BARREL		SIZE OF REGULAR POINT		SIZE OF WIDE POINT	
		Width	Thickness	Width	Thickness	Width	Thickness	Width	Thickness
Dry 1½	6¾	1 1/16	1 1/16	1 7/8	1 1/16	1 1/16	1 1/16		
Green		1¾	1 3/16	1½	1½	1 1/16 f	1½		
Dry 1⅝	6⅞	1 1/16	1 3/16	1 9/16	1 1/16	1 3/16	1 1/16		
Green		1 7/16	1¼	1 5/16	1 3/16	1 3/16 f	1 3/16		
Dry 1¾	7	1 1/16	1¼	1 5/16 f	1 3/16	1 3/16 f	1 3/16		
Green		2	1 5/16	1 1/16 f	1¼	1¼	1¼		
Dry 1⅞	7⅛	2 1/16	1 5/16	1¾ f	1¼	1¼	1¼ f		
Green		2 1/16	1 3/16 f	1 1/16 f	1 5/16 f	1¼ f	1 5/16 f		
Dry 2	7¼	2 1/16	1 5/16	1 7/16	1¼	1¼ f	1¼	1½	1¼
Green		2¼	1 3/16 f	1 1/16	1 5/16 f	1 5/16	1 5/16 f	1 9/16	1 5/16 f
Dry 2⅛	7⅜	2 5/16	1 3/16	2	1 5/16	1 5/16	1 5/16	1 9/16	1 5/16
Green		2 3/16 f	1 7/16 f	2 1/16	1 3/16 f	1 5/16 f	1 3/16 f	1 11/16	1 3/16 f
Dry 2¼	7½	2 7/16	1 7/16	2 1/16	1 3/16	1 3/16	1 1/16	1 11/16	1 3/16
Green		2½ f	1 5/16	2 3/16	1½	1 7/16	1½	1¾	1½
Dry 2⅜	7⅝	2 5/16	1½	2¼	1 7/16	1 7/16	1 5/16	1¾	1 7/16
Green		2 5/16 f	1 5/16	2 5/16	1 9/16	1½	1 9/16	1 13/16	1 9/16
Dry 2½	7¾	2 11/16	1 5/16	2 3/16	1½	1½	1½	1 7/8	1½
Green		2¾ f	1 11/16	2 7/16 f	1 5/16	1 9/16	1 5/16	1 15/16	1 5/16
Dry 2⅝	7⅞	2 11/16	1 5/16	2½	1 9/16	1 5/16	1 9/16	2	1 9/16
Green		2 7/16 f	1 3/4 f	2 9/16 f	1 11/16 f	1 11/16	1 11/16 f	2 1/16	1 11/16 f
Dry 2¾	8	2 11/16	1¾	2 5/16	1 11/16	1 11/16	1 11/16	2 1/16	1 11/16
Green		3 1/16	1 7/16 f	2 11/16 f	1 11/16 f	1 7/16	1 11/16 f	2 5/16	1 11/16 f
Dry 2⅞	8⅛	3 1/16	1 11/16	2¾	1¾	2	1¾	2¼	1¾
Green		3 5/16	1 11/16 f	2 11/16 f	1 7/16 f	2 1/16	1 7/16 f	2 5/16 f	1 7/16 f
Dry 3	8¼	3 1/16	1 11/16	2 7/16	1 11/16	2¼	1 11/16	2¼	1 11/16
Green		3 5/16	2 1/16	3	2	2 1/16 f	2	2 5/16 f	2
Dry 3¼	8½	3 7/16	2 1/16	3 1/16	1 11/16	2 3/16	1 11/16	2 3/16	1 11/16
Green		3 9/16	2¼	3¼	2½	2 5/16 f	2½	2 7/16 f	2⅛
Dry 3½	8¾	3 11/16	2 1/16	3 3/16	2	2½	2	2½	2
Green		3 13/16	2 5/16	3½	2 1/16	2 7/16 f	2 1/16	2 5/16 f	2 1/16

Note:—"f" signifies full size.

TOTAL LENGTH OF HEAD AND THROAT.—Make exact length to figures given from head end to where throat and barrel knives lap, the head or square must be at least of ample length for tenon.

SIZE OF HEAD.—Make measurement about where shoulder will be when tenoned.

SIZE OF BARREL.—Make measurement just below where barrel and throat knives lap. Make hinds exact width as figures given. Front spokes having more taper should be made 1/16 inch less in width of barrel.

SIZE OF POINT.—Measurement to be made ½ inch from point end of all lengths. From face to back is to be considered the wide way.

REGULAR LENGTHS.—Fronts, all sizes, 22 inches long; hinds, all sizes 2½ inches and under, 26 inches long; all sizes, 2⅝ inches and over, 28 inches long.

The above specifications for Dry are intended for thoroughly dry stock at least twelve months or more old; and for Green are intended for entirely green stock. When stock is half dry, say six months old, allow for shrinkage about half the difference between dry and green specifications. When not quite dry, make a little full of Dry Specifications. When not quite green, make a little scant of Green Specifications.

Keep your lathe knives adjusted to a straight line so the spoke will be of even thickness from the point to the throat.

Adopted by Spoke Manufacturers' Association December 20, 1906.

Revised March 25, 1908.

Adopted by the National Wagon Manufacturers' Association April 28, 1909.

HARDWOOD DIMENSION MATERIAL

Oak Chair and Furniture Stock

All pieces must be taken as they are manufactured, and no allowance made to change grade by re-manufacture. All stock to be of practically uniform thickness and width, to be full thickness and width when dry. Any amount of bright sap admissible in all Chair and Furniture Dimension Stock. Seat Stock to have one clear face and two ends; no defect admissible in edges that will show after jointing.

Chair Frame Stock to have one clear face, both ends, and both edges.

Table Tops take same inspection as Seat Stock. Squares for turning shall contain no defect that will not turn out. Squares for dressing up and to be used as squares must be clear on all adges and ends that show.

Chair Backs that show on two sides must be clear both sides, both edges, and both ends; all Quartered Oak must show figure on one face. No badly discolored or doty sap admissible in any of the above stock.

All band sawed pattern stock to show four clear sides unless contract is made to contrary setting forth that defects may be permitted on any one or more sides.

IMPLEMENT STOCK

Plow Handle Strips must be practically straight-grained, and clear of all defects, except slight streaks and small bird pecks, or small bright knots located so as not to interfere with the bending of the piece or its strength.

CUBAN MAHOGANY

Grades: Prime, Selects, Rejects, Shorts and Counters.
Lengths: 2 feet and over.
Widths: 3 inches and over.
Thicknesses: Standard.
All odd lengths must be measured.

Prime

Prime must be 6 inches and over wide, 8 feet and over long, not to exceed 25% of 8 and 9-foot lengths.

Standard defects are admitted according to widths as follows:

6 or 7 inches, 1 standard defect or its equivalent.

8 or 9 inches, 2 standard defects or their equivalent.

10 to 11 inches, 3 standard defects or their equivalent.

12 inches or over, 4 standard defects or their equivalent.

Selects

Selects may be 4 inches and over wide, 6 feet and over long, and must work two-thirds clear, with no cutting less than 4 inches wide and 3 feet long, or 3 inches wide and 4 feet long.

Rejects

Rejects must be 3 inches and over wide, 6 feet and over long, and must work 50% clear. No piece or cutting considered which is less than 4 inches wide and 2 feet long, or 3 inches wide and 3 feet long.

Shorts

Shorts must be 3 inches and over wide, 2 to 7 feet long, and must be prime in quality.

Pieces 3, 4 and 5 inches wide must be clear.

Pieces 6 inches and over wide must be graded same as Prime.

Counters

Counters must be 12 to 40 feet long, 16 to 24 inches wide. Splits to be measured out.

Clear Strips

Clear Strips must be 2½ to 5½ inches wide, 5 feet and over long, clear of defects on one face and two edges. Reverse face must be sound.

MEXICAN AND AFRICAN MAHOGANY

Grades: First, Second, No. 1 Common, No. 2 Common, Shorts and Counters.
Lengths: 2 feet and over.
Thicknesses: Standard.
Widths: 3 inches and over.
All odd lengths must be measured.
One inch of bright sap in the aggregate is a standard defect.
The percentage of Firsts in the combined grade of Firsts and Seconds to be as follows:
Mexican Mahogany—Not less than 40 per cent.
African Mahogany—Not less than 35 per cent.

Firsts

Firsts must be 7 inches and over wide, 10 feet and over long, and free from all defects, except that pieces 10 feet and over surface measure may have one standard defect or its equivalent.

Seconds

Seconds must be 6 inches and over wide.
Standard defects are admitted according to surface measure as follows:
6 feet, 1 standard defect or its equivalent.
9 feet, 2 standard defects or their equivalent.
13 feet, 3 standard defects or their equivalent.
18 feet and over, 4 standard defects or their equivalent.

No. 1 Common

No. 1 Common must be 4 inches and over wide, 6 feet and over long.
Pieces 4 inches wide, 6 to 11 feet long, must work 66 2/3% clear in not over two pieces; 12 feet and over long must work 66 2/3% clear in not over three pieces. No piece or cutting to be less than 2 feet long by the full width of the piece.

Pieces 5 inches and over wide, 6 to 11 feet long, must work 66 2/3% clear in not over two pieces; 12 feet and over long must work 66 2/3% clear in not over three pieces. No piece of cutting to be considered which is less than 4 inches wide and 2 feet long, or 3 inches wide and 3 feet long.

No. 2 Common

No. 2 Common must be 3 inches and over wide, 2 feet and over long, and must work 50% clear. No piece or cutting considered which is less than 3 inches wide and 2 feet long.

Shorts

Shorts must be 4 inches and over wide, 2 to 5 feet long.
Pieces 4 to 5 inches wide must be clear.
In pieces 6 inches and over standard defects are admitted according to surface measure as follows:
2 feet, 1 standard defect or its equivalent.
4 feet, 2 standard defects or their equivalent.
5½ feet, 3 standard defects or their equivalent.
6½ feet and over, 4 standard defects or their equivalent.

Counters

Counters must be 12 to 40 feet long, 18 to 24 inches wide, and must be free from all defects. Splits to be measured out.

SPECIFICATIONS FOR GRADING OF LOGS

Standard lengths for logs must be 12', 14' and 16' long, and all logs must be cut 4" longer than these lengths to allow for properly trimming the lumber.
All logs must be straight and are to be measured at the small end, the narrow way inside of the bark.
In all No. 1 logs the sap must be bright.

Red and White Oak

No 1 Logs must be 24" and up in diameter. Surface and ends clear.

No. 2 Logs must be 18" and up in diameter, 18" to 20" inclusive must be surface and ends clear, 21" and up shall show 75% clear.

No. 3 Logs must be 14" and up in diameter, 14" to 16" inclusive must be surface and ends clear. 17" and up must show 50% clear.

White Ash

No. 1 Logs must be 18″ and up in diameter. Surface and ends clear.

No. 2 Logs must be 14″ and up in diameter. 14″ to 17″ inclusive must be surface and ends clear. 18″ and up must show 75% clear.

Cottonwood

No. 1 must be 24″ and up in diameter. Surface and ends clear.

No. 2 must be 16″ and up in diameter. 16″ to 19″ inclusive must be surface and ends clear. 20″ and up must show 65% clear.

Gum

No. 1 Logs must be 24″ and up in diameter. Surface and ends clear and must not show over 5″ of bright sap outside of the red.

No. 2 Logs must be 20″ and up in diameter. 20″ and 23″ inclusive must be surface and ends clear. 24″ and up must show 75% clear.

Elm and Soft Maple

16″ to 19″ inclusive must show surface and ends clear. 20″ and up must show 65% clear.

Hickory

Must be live timber 12″ and over in diameter, and must show surface and ends clear.

Cypress

No. 1 Logs must be 24″ and up in diameter. Surface and ends clear.

No. 2 Logs must be 18″ and up in diameter. 18″ to 21″ inclusive must be surface and ends clear. 22″ and up must show 75% clear.

No. 3 Logs must be 14″ and up in diameter. 14″ to 16″ inclusive must be surface and ends clear. 17″ and up must show 50% clear.

Walnut

Logs to be 12″ and over in diameter. Length 8 to 16 feet. Prime logs to be straight, sound and smooth. Deductions for excessive sap to be made according to the diameter of the log. Value arrived at in accordance with the other defects.

Official Weights on Logs

Adopted February 5, 1913

	Basis. Pounds	Actual. Pounds.
Ash, per foot	10.00	9.84
Cotton wood, per foot	11.50	11.45
Cypress, per foot	9.00	8.99
Gum, per foot	11.00	10.82
Hickory, per foot	12.00	12.00
Oak, per foot	11.00	10.95

OFFICIAL SYMBOLS
FOR GRADE MARKS

PANEL AND WIDE No 1. O

WIDE No 2. A

BOX BOARDS B

FAS OR FIRSTS & SECONDS 2

SAPS S

SELECTS Δ

No 1. COMMON. (1)

No 2. COMMON. (2)

No 3. COMMON. (3)

No 4. COMMON. (4)

Universal Standard Log Scale

A combination of the Doyle and Scribner rules. Doyle 27 inches and under. Scribner 28 inches and over.

OFFICIAL SCALE OF

THE HARDWOOD MANUFACTURERS' ASSOCIATION OF THE UNITED STATES

LENGTH IN FEET

DIAMETER IN INCHES	8	10	12	14	16	18	20	22	24
10	18	23	27	32	36	41	46	50	54
11	24	31	37	43	49	55	61	67	74
12	32	40	48	56	64	72	80	88	96
13	40	50	61	71	81	91	101	111	122
14	50	62	75	88	100	112	125	137	150
15	60	75	91	106	121	136	151	166	181
16	72	90	108	126	144	162	180	198	216
17	84	106	127	148	169	190	211	232	253
18	98	122	147	171	196	220	245	269	294
19	112	141	169	197	225	253	280	309	338
20	128	160	192	224	256	288	320	352	384
21	144	181	217	253	289	325	361	397	433
22	162	202	243	283	324	364	404	445	486
23	180	226	271	313	359	406	452	496	541
24	200	250	300	350	400	450	500	550	600
25	220	276	331	386	441	496	551	606	661
26	242	302	363	423	484	544	605	665	726
27	264	330	397	463	530	596	661	726	794
28	291	363	436	509	582	654	728	800	873
29	305	381	457	533	609	685	761	838	914
30	328	411	493	575	657	739	821	904	986
31	355	444	532	622	710	799	888	976	1065
32	368	460	552	644	736	828	920	1012	1104
33	392	490	588	686	784	882	980	1078	1176
34	400	500	600	700	800	900	1000	1100	1200
35	438	547	657	766	876	985	1095	1204	1314
36	462	577	692	807	923	1088	1152	1268	1384
37	514	644	772	901	1029	1158	1287	1415	1544
38	534	669	801	934	1068	1201	1335	1468	1600
39	560	700	840	980	1120	1260	1400	1540	1682
40	602	752	903	1053	1204	1354	1505	1655	1806
41	636	795	954	1113	1272	1431	1590	1749	1908
42	671	840	1007	1175	1343	1511	1679	1846	2014
43	698	872	1046	1222	1396	1571	1745	1918	2092
44	740	925	1110	1295	1480	1665	1850	2035	2220
45	759	949	1139	1329	1518	1707	1898	....	....
46	793	991	1190	1388	1587	1785	1983	....	....
47	828	1035	1242	1449	1656	1862	2070	....	....
48	864	1080	1296	1512	1728	1944	2160	....	....

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FEBRUARY 1, 1915

STANDARD CLASSIFICATION, GRADING AND DRESSING RULES

FOR

DOUGLAS FIR, SPRUCE, CEDAR AND WESTERN HEMLOCK PRODUCTS

Adopted by the

WEST COAST LUMBER MANUFACTURERS' ASSOCIATION

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GENERAL INSTRUCTIONS

1. All lumber is graded with special reference to its suitability for the use intended.

2. With this in view each piece is considered and its grade determined by its general character, including the sum of all its defects.

3. What is known as "Yard Lumber" such as Dimension, Common Board, Finish, etc., is graded from the face side, which is the best side, except that lumber which is dressed one side only is graded from the dressed side.

4. Factory lumber, which is used for the manufacture of Doors, Sash, etc., and must show on both sides, is always graded from the poorer side. The grade is determined by the quantity of suitable cuttings obtainable in each piece.

5. The defects in lumber are to be considered in connection with the size of the piece, and for this reason wider and longer pieces will carry more defects than smaller pieces in the same grade.

6. No arbitrary rules for the inspection of lumber can be maintained with satisfaction. The variations from any given rule are numerous and suggested by practical common sense, so nothing more definite than the general features of different grades should be attemted by rules of inspection.

7. Lumber must be accepted on grade in the form in which it was shipped. Any subsequent change in manufacture or mill work will prohibit an inspection for the adjustment of claims, except with the consent of all parties interested.

8. A shipment of any grade must consist of a fair average of that grade, and cannot be made up of an unfair proportion of the better or poorer pieces that would pass in that grade. A shipment of mixed widths shall contain a fair assortment of each width. A shipment of mixed lengths shall contain a fair assortment of each length.

9. Material not conforming to standard sizes shall be governed by special contract.

10. Standard lengths for lumber are multiples of one foot and two feet as specified.

11. The grade of all regular stock shall be determined by the number, character, and position of the defects visible in any piece. The enumerated defects herein described admissible in any grade are intended to be descriptive of the coarsest piece such grades may contain, but the average quality of the grade should be midway between the highest and lowest pieces allowed in the grade.

12. All dressed lumber shall be measured and sold at the full size of rough material used in its manufacture.

13. All lumber one inch or less in thickness shall be counted as one inch thick.

14. In determining the seriousness of the pitch pocket as a defect both its width and length must be considered. The tighter the pocket the longer it may be.

15. Size and number of pockets admissible in any piece must be left largely to the judgment of the grader and a reasonable deviation from the number of pockets specified in the rules will be permissible.

16. Pitch shakes are clearly defined openings between the grain of the wood, are either filled with granulated pitch or not, but in either case a serious defect, and must not be admitted in any grade above No. 2 Common.

17. A pitch streak is a well defined accumulation of pitch at one point in the piece and when not sufficient to develop a well defined streak, or where fiber between grains is not saturated with pitch, it shall not be considered a defect.

18. A small pitch streak shall be equivalent to not over one-twelfth the width and one-sixth the length of the piece it is in.

19. A standard pitch streak shall be equivalent to not over one-sixth the width and one-third the length of the piece it is in.

20. Splits and Checks shall be considered as to length and direction.

21. Wane is bark or lack of wood on edges of lumber from any cause.

22. Chipped grain consists in part of the surface being chipped or broken out in small particles below the line of the cut, and as usually found should not be classed as torn grain and shall be considered a de-

fect only when it unfits the piece for use intended.

23. Torn grain consists in a part of the wood being torn out in dressing. It occurs around knots and curly places, and is of four distinct characters—slight, medium, heavy and deep.

24. Slight torn grain should not exceed 1/32 of an inch in depth, medium 1/16 of an inch, and heavy ⅛ of an inch. Any torn grain more than ⅛ of an inch shall be termed deep.

25. Loosened grain consists in a point of one grain being torn loose from the next grain. It occurs on the heart side of the piece and is a serious defect, especially in flooring.

26. In standard manufacture of Factory Flooring, Decking or thick dressed and matched stock, and stock grooved for splines, and for Shiplap, the finished width shall be ½ inch less over all than the count or measured width of the rough material used in manufacture and the tongue and lap shall be measured to determine the finished width.

27. Equivalent means equal, and in construing and applying these rules, the defects allowed, whether specified or not, are understood to be equivalent in damaging effect to those mentioned applying to stock under consideration.

DEFECTS

28. Recognized defects are knots, knot holes, splits, checks, wane, rot, rotten streaks, pin and grub worm holes, dog and picaroon holes, pitch seams or shakes, pitch pockets, chipped, torn and loose-grain, solid pitch, stained heart, sap stain and imperfect manufacture.

KNOTS

29. Knots shall be classified as pin, small, standard and large as to size, round and spike as to form and tight, loose and rotten as to quality.

30. **A Pin Knot** is tight and not over ¼ inch in diameter.

31. **A Small Knot** is tight and not over ¾ inch indiameter.

32. **A Standard Knot** is tight and not over 1½ inches in diameter.

33. **A Large Knot** is tight and any size over 1½ inches in diameter.

34. **A Round Knot** is oval or circular in form.

35. **A Spiked Knot** is one sawn in a lengthwise direction.

36. **A Tight Knot** or sound knot is one solid across its face, is as hard as the wood it is in, and is so fixed by growth or position that it will retain its place in the piece.

37. **A Loose Knot** is one not held firmly in place by growth or position.

38. **A Rotten Knot** is one not as hard as the wood it is in.

39. The mean or average diameter of knots shall be considered in applying or construing the rules.

PITCH

40. Pitch pockets are openings between the grain of the wood, containing more or less pitch, and surrounded by sound grain wood.

SAP

41. **Bright Sap** shall not be considered a defect in any of the grades, except as specially provided for in the following rules:

42. **Sap Stain** shall not be considered a defect except as provided herein.

43. **Discoloration** of heart wood or stained heart must not be confounded with rot or rotten streaks. The presence of rot is indicated by a decided softness of the wood where it is discolored, or by small white spots resembling pin worm holes.

MISCELLANEOUS

44. Defects in rough stock caused by improper manufacture and drying will reduce the grades, unless they may be removed by dressing such stock to standard sizes.

45. Imperfect manufacture in dressed stock, such as torn grain, broken knots, mismatching, insufficient tongue or groove on Flooring, Ceiling, Drop Siding, etc., shall be considered defects and will reduce the grade accordingly as they are slight or serious in their effect on the use of the stock. Pieces of Flooring, Partition or Drop Siding, having less than 3/16 inch of tongue, and pieces of Ceiling with less than ⅛ inch of tongue, will not be admitted in any grade above No. 3 Clear. Pieces with this amount or more of tongue will be admitted in any grade.

STANDARD SIZES.

46. In the absence of a special agreement between the buyer and seller for each order, all dressed lumber is finished to the following sizes:

47. **Flooring**—1x3, finished size, 13/16x2¼ face; 1x4, finished size, 13/16x3¼ face; 1x6, finished size, 13/16x5⅛ face; 1¼x3, finished size, 1 1/16x2¼ face; 1¼x4, finished size, 1 1/16x3¼ face; 1¼x6, finished

size, 1 1/16x5⅛ face; 1x6 F. G. Flooring, finished size, ¾x5⅛. Standard lengths are multiples of one foot.

48. **Ceiling**—⅜x4, finished size, 5/16x3¼ face; ⅜x6, finished size, 5/16x5⅛ face; ½x4, finished size, 7/16x3¼ face; ½x6, finished size, 7/16x5⅛ face; ⅝x4, finished size, 9/16x3¼ face; ⅝x6, finished size, 9/16x5⅛ face; 1x4, finished size, 11/16x3¼ face; 1x6, finished size, 11/16x5⅛ face. Standard lengths are multiples of one foot.

49. **Partition**—1x4, finished size, 11/16x3¼ face; 1x6, finished size, 11/16x5⅛ face. Standard lengths are multiples of one foot.

50. **Drop Siding**—1x4, finished size, ¾x3¼ face, ¼ inch tongue; 1x6, finished size, ¾x5⅛ face, ¼ inch tongue; 1x8, finished size, ¾x7 face, ¼ inch tongue. Standard lengths are multiples of two feet.

51. **Rustic**—1x6 channel, finished size, ¾x4⅞, ½ inch Rabbet; 1x8 channel, finished size, ¾x6¾, ½ inch Rabbet; 1x6 V, finished size, ¾x4⅞, ½ inch Rabbet; 1x8 V, finished size, ¾x6¾, ½ inch Rabbet. For further particulars see diagrams of standard patterns. Standard lengths are multiples of two feet.

52. **Finish**—Thickness S1S or S2S—1 inch to ¾ inch; 1¼ inches to 1 1/16 inches; 1½ inches to 1 5/16 inches; 2 inches to 1¾ inches.

53. **Widths If Dressed on One or Both Edges**—4 inches to 3½ inches; 5 inches to 4½ inches; 6 inches to 5½ inches; 8 inches to 7¼ inches; 10 inches to 9¼ inches; 12 inches to 11¼ inches; 14 inches to 13 inches; 16 inches to 15 inches. Standard lengths are multiples of one foot.

54. **Battens**—Are usually made of edgings of good, sound stock and worked to the following sizes: 3 inch flat to 5/16x2½ inch; 2 inch O. G. to ¾x1¾ inch; 2½ inch O. G. to ¾x2¼ inch; 3 inch O. G. to ¾x2½ inch. Standard lengths are multiples of one foot.

55. **Wagon Bottoms**—Finished sizes, 13/16 and 1 1/16x38 inch and 42 inch face.

56. **Pickets**—1¼ inch square, 1 1/16x1 1/16 inch S4S; 1½ inch square, 1 5/16x1 5/16 inch S4S; 1x3 flat, ¾x2¼ inch S4S.

57. **Standard Lath**—⅛ inch x 1½ inch x 4 feet.

58. **Bevel Siding**—6 in., 3/16 inch thin edge; ½ inch thick edge; 5½ inch wide. 4 inch, same thickness, 3½ inches wide. Standard lengths are multiples of one foot.

59. **Common Boards**—S1S or Shiplap to ¾ inch.

60. **Grooved Roofing**—¾ inch x 7¼, 9¼, 11¼ inch face. ½ inch groove 1½ inches from each edge.

61. **Shiplap and D. & M.**—1x8, finished size, ¾x7 face; 1x10, finished size, ¾x9 face; 1x12, finished size, ¾x11 face. Standard lengths are multiples of two feet.

62. **Dimension, S1S1E or S4S**—2x4 to 1⅝x3⅝; 2x6 to 1⅝x5⅝; 2x8 to 1⅝x7½; 2x10 to 1⅝x9½; 2x12 to 1⅝x11½; 3x6 to 2½x5½; 3x8 to 2½x7½; 3x10 to 2½x9½; 3x12 to 2½x11½. Stock more than 12 inches wide, sizes to ½ inch off in width.

63. **Timbers, S1S1E or S4S**—4x4 and larger, ½ inch off each way. Standard lengths are multiples of two feet unless otherwise specified.

64. All sizes in Dimension and Timbers are subject to natural shrinkage.

65. **Door Cuttings**—Stiles, 5 or 6 inches wide; 6 feet 8 inches to 7 feet 6 inches long.

66. **Bottom Rails**, 9 or 10 inches wide; 2 feet 4 inches to 3 feet long.

67. **Rails**, 5 or 6 inches wide; 2 feet 4 inches to 3 feet long.

68. **Shop Common S2S**—1 inch to 13/16 inch; 1⅛ inches to ⅞ inch; 1⅜ inches to 1 5/32 inches; 1⅝ inches to 1 13/32 inches; 2 inches to 1 25/32 inches; 2½ inches to 2 9/32 inches; 3 inches to 2 25/32 inches; 4 inches to 3 25/32 inches.

CAR MATERIALS—STANDARD LENGTHS

69. **Car Siding**—8, 9, 10 and 12 feet or multiples.

70. **Car Roofing**—5 feet or multiples.

71. **Car Lining**—8, 9, 10, 12, 14, 16, 18 and 20 feet or multiples.

72. **Car Decking**—9 and 10 feet or multiples.

73. All orders shall be shipped in the standard length called for, unless otherwise specified, but no lengths of either car siding, lining or roofing shall be shipped, except in the lengths specified or multiples thereof. Those who do not desire stock shipped in multiple lengths should so specify. Fractional lengths figured at next longest standard length.

CAR SILLS AND FRAMING

74. Sizes up to 6 inches in width shall measure full when green, and not more than ⅛ inch scant when dry or part dry. Sizes 6 to 12 inches in width shall measure full when green and not more than ¼ inch scant when dry or part dry. Sizes 12 to 16 inches in width shall measure full when green and not more than ⅜ inch scant when dry or part dry. Unless otherwise specified, ¼ inch shall be allowed for each side which is to be dressed. Where stock is wanted dressed smooth all four sides, timber shall be sawed ½ inch full over the dressed sizes required. In pieces 3 by 6 inches and under when ordered in lengths

exceeding 30 feet, sound knots shall not exceed one-quarter the width of the face through which they project, and the grain shall not cross sufficient to impair the strength. Fractional lengths figured at next longest standard length, standard lengths in car sills and framing being multiples of two feet.

FIR

75. Fir is a wood adapted to many uses. It is the strongest softwood known, and for this reason is especially useful for bridge timber and framing lumber of all kinds. Owing to its handsome color and grain, and being susceptible of high polish, it is extensively used for finish.

76. Fir is sawn and sorted with reference to the direction of the grain. The "Vertical Grain" (called "V. G." in these rules and all price lists) has the grain at or nearly at right angles with the face of the board, and is adapted to Flooring, Stepping, etc., because it does not "silver" with wear. "Flat Grain" (F. G.) means that the grain is parallel or nearly parallel with the face of the board. The Flat Grain is selected for finish because of the beauty of the wood in this form.

NAMES AND GRADES

77. **Flooring**—No. 1 Clear V. G.; No. 2 Clear V. G.; No. 3 Clear V. G.; No. 4 Clear V. G.; No. 2 Clear and Better F. G.; No 3 Clear F. G.; No. 4 Clear F. G.

78. **Ceiling**—No. 2 Clear and Better; No. 3 Clear.

79. **Partition**—No. 2 Clear and Better; No. 3 Clear.

80. **Drop Siding and Rustic**—No. 2 Clear and Better; No. 3 Clear.

81. **Stepping**—No. 2 Clear and Better V. G.; No. 3 Clear.

82. **Finish**—Selected Grain; No. 2 Clear and Better; No. 3 Clear.

83. **Wagon Bottoms**—One grade only V. G; one grade only F. G.

84. **Fencing**—One grade only.

85. **Boards**—Select Common; Common; No. 3 Common or Sheathing.

86. **Defects** based on piece 4 inches wide, 12 feet long, on all the following to and including Casing and Base, excepting where otherwise stated.

VERTICAL GRAIN FIR FLOORING

87. **No. 1. Clear**—Vertical Grain, 3, 4 and 6-inch. Shall be well milled on face, must have perfect edges and be practically free from all defects. Bright sap showing not more than one-third of face half the length of piece will be admitted. Angle of grain not less than 45 degrees.

88. **No. 2 Clear.**—Vertical Grain, 3, 4 and 6 inch. Shall be well manufactured. Angle of grain not less than 45 degrees. Will admit of slight roughness in dressing, and from one to three small, close pitch pockets, or equivalent defects.

89. **No. 3 Clear**—Vertical Grain, 3 4 and 6 inch. Angle of grain not less than 45 degrees. Will admit of roughness in dressing; two small knots not over ¾ inch in diameter or four small pitch pockets, any two of which may be open. It is generally understood that this grade will admit such defects or combination of defects as will not impair its utility for cheap floors. A piece otherwise as good as No. 2, may have a defect that can be cut out and the piece laid with a loss of not more than 2½ inches in its length, providing the defect is 4 feet or more from the end of the piece.

90. **No. 4 Clear**—Vertical Grain, 3, 4 and 6 inch. Shall be anything below No. 3 that can be utilized.

FLAT GRAIN FIR FLOORING

91. **No. 2 Clear and Better**—Flat Grain, 3, 4 and 6 inch. Shall be well manufactured; will admit of slight roughness in dressing. Either of the following also permitted with the above: Three close pitch pockets, not to exceed two inches each in length; one small tight, smooth knot ½ inch in diameter, or their equivalent of combined defects.

92. **No. 3 Clear**—Flat Grain, 3, 4 and 6 inch. Will admit of roughness in dressing; two small knots not over ¾ inch in diameter, or four small pitch pockets, any two of which may be open, or the equivalent of combined defects. A piece otherwise as good as No. 2 can have a defect that can be cut out and the piece laid with a waste of not more than 2½ inches in its length, providing the defect is 4 feet or more from the end of the piece. Vertical grain pieces that are a little below the line of No. 3 vertical grain will be admitted in this grade. It is generally understood that this grade will admit such other defects or combination of defects as will not impair its utility for cheap floors and sheathing.

93. **No. 4 Clear**—Flat Grain, 3, 4 and 6 inch. Shall be anything below No. 3 that can be utilized.

FIR CEILING

94. **No. 2 Clear and Better**—3, 4 or 6 inch. Shall be well manufactured. Will admit of slight roughness in dressing. Either of the following also permitted with the above: Three close pitch pockets, not to exceed 2 inches each in length; one small, tight, smooth knot ½ inch in diameter or their equivalent in combined defects. Both Vertical and Flat Grain admissible. Hemlock permitted in this grade.

95. **No. 3 Clear**—3, 4 and 6 inch. Same grade as in paragraph 92 applying to No. 3 Flat Grain Flooring. Both Vertical and Flat Grain admissible. Hemlock permitted in this grade.

FIR PARTITION

96. **Partition**—4 or 6 inch. Shall be graded from its poorest side. Grades to be the same as ceiling. Hemlock permitted.

FIR DROP SIDING AND RUSTIC

97. **No. 2 Clear and Better**—4, 6 and 8 inch. Defects based on piece 6 inches wide, 12 feet long. Shall be well manufactured. Slight roughness in dressing admissible; will allow three small, tight knots not more than ½ inch in diameter or four tight pitch pockets or their equivalent of combined defects. Hemlock permitted in this grade.

98. **No. 3 Clear**—4, 6 and 8 inch. Will admit of roughness in dressing; three knots not larger than 1 inch in diameter, or five small pitch pockets, any three of which may be open, or their equivalent of combined defects. A piece that is otherwise as good as No. 2 may have a defect that can be cut out by wasting not more than 2½ inches in the length of the piece, providing that it is more than 4 feet from the end of the piece. Hemlock permitted in this grade.

99. **Note:** In all grades of Flooring, Ceiling, Drop Siding, etc., wane on the reverse side not exceeding one-third the width and one-sixth the length of any piece, provided the wane does not extend into the tongue, is admissible.

FIR FINISH

100. **Selected Grain**—1, 1¼, 1½ and 2 inches thick, 4 to 12 inches wide. Shall be free from sap and all defects, on face and edges, and selected for beauty and character of grain.

101. **No. 2 Clear and Better**—Based on 1x8-12. Rule to apply proportionately on narrower or wider and thicker stock. Will admit of slight roughness in dressing. Will allow one straight split not longer than the width of the piece; a small amount of stain. In addition to one of the above one of the following will be allowed: Three small tight pitch pockets not to exceed two inches in length, three small, tight, smooth knots not over one-half inch in diameter, or their equivalent of combined defects. A piece 14 feet or longer may have a defect located six or more feet from the end of the piece that can be cut out by wasting not more than 1½ inches in length provided balance of piece be practically free from defects. Either flat or vertical grain admissible.

102. **No. 3 Clear**—1, 1¼, 1½ and 2 inches thick, 4 to 12 inches wide. Based on 1x8-12. Rules to apply proportionately on narrower and wider stock. Will admit of medium torn grain, heavy torn grain in two or three places; season checks that do not go through; stain covering one-fourth of the face of the piece. With any one of the above, one of the following or their equivalent of combined defects will be allowed: Four small pitch pockets or their equivalent of larger pockets; one standard pitch streak; four small knots; two 1 inch knots or their equivalent of pin knots; four picaroon holes or other defects.

103. **Rough Clear**—4 inch and wider. Must be evenly manufactured, 1 inch, 1¼ inch and 1½ inch, shall not be more than 1/16 inch; and 2 inch not more than ⅛ inch scant in thickness, and must be ¼ inch more than finished size in width. Wane and season checks and other defects that will dress out in working standard sizes are admissible. Rough finish to be graded on the best side, but the reverse side must be not more than one grade lower. Subject to these provisions the rules governing dressed Finish shall apply to Rough. When like grade on both faces is required special contract must be made.

FIR STEPPING

104. **No. 2 Clear and Better**—8 to 14 inch. Defects based on piece 10 inches wide and 12 feet long. Shall be well manufactured. Will allow slight roughness in dressing or five close pitch pockets. With one of the foregoing defects, may have from one to three knots that do not show more than 2 inches on riser edge of the face side, or flat grain one-fourth of the face on the riser edge.

105. **No. 3 Clear**—Will admit of medium torn grain in two or three places; season checks that do not go through; stain covering one-fourth of the face of the piece. With any one of the above, one of the following or their equivalent of combined de-

fects will be allowed; eight small pitch pockets or their equivalent of larger pockets; wane ½ inch deep on back edge, one standard pitch streak, four small knots; two 1 inch knots.

FIR TANK STOCK

106. Must be water tight the full length of the piece, unless it is for cutting stock. Small knots, or pitch pockets which do not go through the piece, not to be considered defects. Edges to be practically clear or to contain no defects that will prevent a water-tight joint when worked.

107. Two-inch stock to contain practically no sap. 3-inch stock when 12 inches wide, to allow 3 inches of sap on both edges of face side, not to extend over ¾ of an inch through the piece. Can be either vertical or flat grain.

FIR WIND MILL TOWER STOCK

108. Shall be graded as Select Common. Shall be S4S or S1S1E, ½ inch scant each way.

FIR SILO STOCK

109. **No. 2 Clear or Better**—Must be square edged to form water-tight joint the full length of piece. Will admit three sound, small knots, or three closed pitch pockets, or a combination of said defects. Defects to be based on a piece 12 feet long. Sap no defect.

110. **Select Common**—Must be square edged the full length of the piece. Will admit any number of sound knots not exceeding 1½ inches in diameter, or pitch pockets that do not go through the piece. Bright sap no defect.

FIR WAGON BOTTOMS

111. To be graded the same as No. 2 and Better Flat Grain Flooring. See paragraph 91.

FIR LATH

112. Shall measure three to the inch in thickness and shall not be over 1/16 inch scant in width or ¼ inch scant in length when green. Shall be clear on face, except a small number of pin worm holes. Opposite side may have wane extending not over one-third the width and one-eighth the length of the piece. Season or sap stain shall not be considered a defect.

FIR TURNED PORCH COLUMNS

113. No. 1 Columns to grade 80 per cent Clear; the balance of 20 per cent to admit of the following slight defects: Three small sound knots not over ¾ inch in diameter on the smooth part of the turned shaft, or on the square, or three tight pitch pockets, to be not over 3 inches long, or the equivalent in both knots and pitch pockets. Bright sap shall be no defect. The 5x5 and the 6x6 shall be bored through with not less than 1¾ inch bit. See paragraph 115.

114. The 4x4 to be bored through the square ends. The Colonial Columns shall be bored through with not less than a 2 inch bit. See paragraph 115.

115. Boring to be at the option of the manufacturer.

FIR CASING AND BASE

116. To be graded same as Finish. See paragraphs 99 and 100.

FIR COMMON

Boards and Shiplap and D. & M.

117. **One Inch Select Common**—4 to 12 inch. Shall be square edged. Will admit sound knots not over 1 inch in diameter in 4 inch and 6 inch and not over 1½ inches in 8 inch to 12 inch, but located away from the edge; medium sized pitch pockets and slight stain. But should be of a sound, strong character. Hemlock permitted in this grade.

118. **Common**—Will admit of any two of the following, or their equivalent of combined defects: Wane ½ inch deep on edge, 1 inch wide on face, extending not over one-sixth of the length of the piece; knots not more than one-third of the width of the piece in diameter; stain; torn grain; pitch streaks; pitch pockets; seasoning checks; one straight split not longer than the width of the piece or a limited number of worm holes well scattered. These boards should be firm and sound and suitable for use in ordinary construction without waste. Hemlock permitted in this grade.

119. **No. 2 Common Boards or Sheathing**—Will admit of all stock below the grade of Common that is suitable for cheap sheathing and will allow: Coarse knots; knot holes; splits; rotten streaks; rotten sap, and any number of grub or pin worm holes. Hemlock permitted in this grade.

FIR FENCING

120. Common Fencing must be manufactured from sound stock; may contain sound

knots equal in diameter to not over one-third of the width of the piece, or spike knots the length of which is not over one-half of the width of the piece. May have wane ¼ inch deep on edge; not over 1 inch on face and one-fourth the length of the piece; torn grain; solid pitch; pitch pockets; stain, seasoning checks, and a limited number of worm holes well scattered. Hemlock permitted in this grade.

DIMENSION

121. **Common Dimension** — Generally speaking, this stock must be suitable and of sufficient strength for all ordinary construction purposes without waste. Will admit of coarser knots than 1 inch Common, which in a 2x4 should not be larger than 2 inches. Spike knots not over 2/3 the width of the piece, wane not over ½ inch deep on edges and 1 inch wide on face, up to 2x6, and ½ inch deep on edge and 1½ inch wide on face on 2x8 and wider, extending not more than ¼ the length of the piece; stain, solid pitch, pitch pockets, season checks, one straight split not more than the width of the piece, 2 or 3 grub worm holes, a limited number of pin worm holes and torn grain. Hemlock permitted in this grade in 4 and 6 inch widths.

122. **No. 2 Common Dimension**—This grade must be suitable for use in a cheaper class of construction than common. Will allow coarse and unsound knots and knot holes that do not unfit the piece for use intended, rotten streaks, pitch seams, pitch pockets, a reasonable amount of rotten sap and pin worm holes, a few grub worm holes well scattered. It is understood that no culls or stock that will not work without waste will be allowed in this grade. Hemlock permitted in this grade in 4 and 6 inch widths.

123. **Select Common**—2x4 to 2x12 and 3x4 to 4x6 shall be square edged. Will admit any quantity sound knots, not over 1 inch in diameter, or small pitch pockets not over 4 inches in length. Sizes larger than 4x6 will admit sound knots not to exceed 1½ inches in diameter; pitch pockets not to exceed 6 inches in length.

FIR TIMBERS

124. **Common**—Rough timbers, 4x4 and larger, shall not be more than ¼ inch scant when green, to allow for variation in sawing, or ½ inch scant when S1S1E or S4S, and be evenly manufactured from sound stock, and must be free from knots that will materially weaken the piece.

125. **Timbers** 10x10 in size may have a 2 inch wane on one corner, or its equivalent on two or more corners, one-fourth the length of the piece. Other sizes may have proportionate defects. Season checks and checks extending not over one-eighth the length of the piece admissible.

126. **No. 2 Common Timbers**—This is a grade of timber that will admit of large loose or rotten knots, shakes or rot that do not impair its utility for temporary work. Hemlock and white fir will be allowed in this grade.

FIR SHIP DECKING

127. **Decking**—Shall be uniformly sawn, firm grain and free from knots and defects on one face and calking edges. Flat sizes shall show edge grain on broad face. Will allow pin and small knots on under side and lower part of calking edges. Bright sap, whether green or seasoned, on face side corner not exceeding one-quarter the width or one-third the length.

FIR TURNING SQUARES

128. **No. 2 Clear and Better**—May contain any defects that will dress or turn off, and may also contain defects that will cover with paint, such as sound knots or hard pitch pockets. If surfaced, size shall be reduced ¼ inch for each side dressed.

FIR PIPE STAVES

129. Must be water-tight the full length of the stave. Small knots or pitch pockets that do not go through the piece not to be considered defects. Edges must be practically clear or to contain no defects that will prevent a water-tight joint when worked. Will admit sap on the inside of the stave not extending more than half way through the piece. Can be either flat or vertical grain.

FIR FACTORY LUMBER

130. **Factory Plank**—Grades as described under this head are valued for cutting qualities only, and should not be confounded, either in quality or value, with grades outlined for yard purposes. Factory plank of all kinds, better than No. 3 Shop, shall be graded for the percentage of Door Cuttings that can be obtained. Two grades of Door Cuttings only shall be recognized, and are to be known as No. 1 and No. 2 Cuttings. The only defect admissible in No. 1 Door Cuttings is bright sap. The grade of No. 2 Door Cuttings will admit of one defect only in any one piece. This may be a small knot of sound character not to ex-

ceed ⅝ inch in diameter, or the defect may be slightly stained sap, which does not extend over more than half the surface of the piece on one side, or one pitch pocket not more than 2 inches long and not extending through the piece.

131. Unless otherwise agreed, Fir Factory stock shall contain not less than 65% of vertical grain stock.

132. **Factory Select and Better**—The grade of Factory Select and Better shall contain 70% and more of No. 1 Door Cuttings in the sizes specified as admissible in No. 1 Shop.

133. **No. 1 Shop Common**—The sizes and grades of cuttings admissible in the grade of No. 1 Shop Common are: (1) No. 1 Stiles in width 5 or 6 inches and in length from 6 ft. 8 in. to 7 ft. 6 in. (2) No. 1 Rails, 9 or 10 inches wide and from 2 ft. 4 in. to 3 ft. in length. (3) No. 1 Muntins, 5 inches wide and from 3 ft. 6 in. to 4 ft. in length. (4) Any number of pieces of either Stiles or Rails mentioned above are admissible in the grade of No. 1 Shop Common; but only two Muntins of the sizes mentioned above shall be considered, and one No. 2 Door stile may also be considered in securing the required percentage of cuttings in any given plank. (5) Each plank of No. 1 Shop Common shall contain not less than 50% nor more than 70% of door cuttings of the sizes and grades herein mentioned.

134. **No. 2 Shop Common**—The sizes admissible in No. 2 Shop Common are: (1) Stiles in width 5 or 6 inches and from 6 ft. 8 in. to 7 ft. 6 in. in length. (2) Rails, 9 or 10 inches in width and from 2 ft. 4 in. to 3 ft. in length. (3) Top rails, 5 inches wide and from 3 ft. 4 in. to 3 ft. in length. Top rails must, however, be of No. 1 Door Cuttings quality, but figured as No. 2 Door Cuttings. (4) Muntings, 5 inches wide and from 3 ft. 6 in. to 4 ft. in length. (5) Any number of cuttings of any one of the above sizes are admissible in the grade of No. 2 Shop Common. (6) Each plank of No. 2 Shop Common shall contain either one of the following: At least 25% of No. 1 Door Cuttings, or not less than 40% of all No. 2 Door Cuttings or not less than 33⅓% No. 1 and No. 2 Door Cuttings combined.

135. **No. 3 Shop Common**—One and one-fourth inches and thicker, will admit all below the grade of No. 2 Shop Common that is of a cutting type, and suitable for sash, door, or other cuttings.

136. **1 inch Factory Select**—This grade shall consist of lumber 5 inches and wider not less than 15/16 inch thick in the rough, containing more than 70% of clear cuttings of the sizes ordinarily used in the manufacture of interior finish.

137. **1 inch Shop Common**—Must be 5 inches and wider, not less than 15/16 inch thick in the rough. Must be of a cutting type to contain not less than 50% nor more than 70% of No. 1 or No. 2 clear cuttings ordinarily used in the manufacture of interior finish. Cuttings to be 5 inches and wider and 3 feet and longer.

138. All factory plank shall be graded from the poor side, and in determining the percentages of door cuttings, consideration must be given to the fact that plank are to be ripped full length in such manner as will yield the highest grade and largest percentage of door cuttings before cross-cutting, except in such cases where plank will yield a higher value by being first cross cut for rails. In such instances as when stock is cross cut for rails, where some of the stock so obtained is too poor for either No. 1 or No. 2 rails, and yet contains stiles or muntins, or top rails, which can be obtained by ripping this cross cut stock, the door cuttings so obtained shall be figured in when determining percentages.

FIR CAR MATERIAL

139. Unless otherwise specified the rules governing the grading of Fir Lumber will apply.

140. **Special Rules for Grading Car Material**—All stock except Car Sills and Framing shall be inspected on the face side to determine the grade. Stock surfaced one side, the dressed surface shall be considered the face side. Stock rough or dressed, two sides, the best side shall be considered the face, but the reverse side of all such stock shall not be more than one grade lower.

141. Lumber and timber sawed for specific purposes must be inspected with a view to its adaptability for the use intended.

142. All dressed stock shall be measured and sold at the full size of rough material necessarily used in its manufacture.

143. **Car Siding**—To be graded the same as T. & G. Flooring.

144. **Car Roofing**—To be graded the same as T. & G. Flooring.

145. **Car Lining**—This grade particularly refers to stock used for inside lining of freight cars. Material of this grade should be sound common lumber and will admit of roughness in dressing, and also may contain five pin, three small and one standard knot

and five pitch pockets in any continuous five feet of length of the piece; or any combination of tight knots or pitch pockets equivalent to those mentioned above.

146. **Standard Car Decking or Flooring**—Shall be well manufactured from sound live timber and shall be free from splits, shake, rot, bark or waney edges, and unsound knots, or pitch pockets, pitch seams or large knots which would unfit the piece for the use intended. This grade will admit of sap and sound knots not to exceed one-third width of piece; provided they are not in clusters.

147. **Common Car Sills and Framing**—Shall be well manufactured from sound live timber, sawed full size to sizes ordered and free from rot, unsound knots, cross grain, bark or waney edges, or shake and will admit of sound knots, provided they are not in groups, not to exceed one-third width of piece, pitch pockets or pitch seams that would not unfit the piece for the purpose intended.

148. **Select Common Car Stock**—Shall be graded according to the rules for Select Common.

149. **Railroad Ties**—Shall be sound common lumber.

FIR BRIDGE STRINGERS

150. **Common**—Shall be sound common lumber, free from large, unsound knots or knots in clusters, or other defects that will materially unfit the piece for the purpose intended.

151. **Select Common**—Sap shall not show on any one corner more than 10% of any side or edge measured across the surface anywhere along the length of the piece. Shall be free from shake, splits or pitch pockets over ⅜ inches wide or 5 inches long. Knots greater than two inches in diameter will not be permitted within one-fourth of the depth of the stringer from any corner nor upon the edge of the piece; knots shall in no case exceed three inches in diameter.

SPRUCE

152. **Description**—Western Spruce is a soft, white wood, both odorless and tasteless in nature. It takes paint freely, consequently has few equals for Bevel Siding, Finish, Sash and Door Stock and many other specialties.

153. **General Instructions**—Spruce Lumber shall be graded and classified according to the following rules and specifications as to quality, and dressed stock shall conform to the standard sizes, except where otherwise expressly stipulated between buyer and seller.

154. There being but a limited amount of sap wood in Spruce, bright sap in any grade shall not be a defect.

NAMES AND GRADES

155. **Flooring**—Clear. A, B.
156. **Ceiling**—Clear. A, B.
157. **Partition**—Clear. A, B.
158. **Wainscoting**—Clear. A, B.
159. **Porch Decking**—Clear. A. B.
160. **Bevel Siding**—A and Better, B, C.
161. **Finishing**—Clear and A; B.
162. **Factory Lumber**—Select and Better. No. 1 Shop. No. 2 Shop. No. 3 Shop. 1-Inch Factory Select. 1-Inch Shop Common.
163. **Moulding Stock**—One grade only.
164. **Turning Squares**—One grade only.
165. **Car Siding and Roofing**—One grade only.
166. **Box Lumber**—No. 1. No. 2. No. 3.

SPRUCE FLOORING

167. **Clear**—Shall be free from all defects on face.

168. **A**—Will admit two slight defects in dressing or three close pitch pockets not to exceed 2 inches each in length.

169. **B**—Will admit of slight roughness in dressing or four close pitch pockets not to exceed 3 inches in length, or two small, sound knots, not to exceed ½ inch in diameter.

SPRUCE CEILING

170. **Clear**—Shall be practically free from all face defects.

171. **A**—Will admit of two slight dressing defects, or close pitch pockets not to exceed a combined length of 6 inches.

172. **B**—Will admit slight roughness in dressing or close pitch pockets not to exceed a combined length of 12 inches, two sound knots not exceeding ½ inch in diameter.

SPRUCE PARTITION

173. **Spruce Partition**—4 or 6 inch. Shall be graded from its poorest side. Grades to be the same as Ceiling.

174. **Spruce Wainscoting**—Shall be graded same as Ceiling.

175. **Spruce Porch Decking**—Shall be graded same as Flooring.

SPRUCE BEVEL SIDING

176. **A and Better**—Will admit of slight defects in dressing, or two close pitch pockets not over 2 inches in length or other minor defects, but each piece shall be suitable for use the full length without waste, containing no defects that will not cover with paint, making a smooth surface.

177. **B**—Will admit of knots up to ½ inch in diameter, small pitch pockets, roughness in dressing or other recognized defects, not to exceed four of any of the said defects, or their equivalent, in any one piece.

178. **C**—Will admit all Siding below a B grade, and may contain any of the recognized defects, provided any piece can be used for the purposes intended, with a waste not exceeding 15 per cent.

SPRUCE FINISH

179. **Clear and A**—Being the highest grade in Spruce Finish, shall be free from serious defects, and capable of use for finishing work without waste. May be of any width or length, and if under 10 inches in width, shall be free from defects. If 10 inches or over, will admit slight defects, such as roughness in dressing.

180. **B**—Will admit of sound knots up to 1 inch in diameter, roughness in dressing, close pitch pockets not over 4 inches long, or other proportionate defects. In widths 12 inches or less there shall not be more than four of said defects to any one piece.

SPRUCE FACTORY LUMBER

181. **Factory Plank**—Grades as described under this head are valued for cutting qualities only, and should not be confounded, either in quality or value, with grades outlined for yard purposes. Factory plank of all kinds, better than No. 3 Shop, shall be graded for the percentage of door cuttings that can be obtained.

182. Two grades of door cuttings only shall be recognized, and are to be known as No. 1 and No. 2 cuttings. The only defect admissible in No. 1 Door Cuttings is bright sap. The grade of No. 2 Door Cuttings will admit of one defect only in any one piece. This may be a small knot of sound character, not to exceed ⅝ inch in diameter, or the defect may be slightly stained sap, which does not extend over more than one-half the surface of the piece on one side, or one pitch pocket not more than 2 inches long, and not extending through the piece.

183. **Factory Select and Better**—The grade of Factory Select and Better shall contain 70% and more of No. 1 Door Cuttings in the sizes specified as admisible in No. 1 Shop Common.

184. **No. 1 Shop Common**—The sizes and grades of cuttings admissible in the grade of No. 1 Shop Common are: (1) No. 1 Stiles in width 5 or 6 inches and in length from 6 ft. 8 in. to 7 ft. 6 in. (2) No. 1 Rails, 9 or 10 inches wide and from 2 ft. 4 in. to 3 ft. in length. (3) No. 1 Muntins, 5 inches wide and from 3 ft. 6 in. to 4 ft. in length. (4) Any number of pieces of either stiles or rails mentioned above are admissible in the grade of No. 1 Shop Common; but only two muntins of the sizes mentioned above shall be considered, and one No. 2 Door stile may also be considered, in securing the required percentage of cuttings in any given plank. (5) Each plank of No. 1 Shop Common shall contain not less than 50% nor more than 70% of door cuttings of the sizes and grades above mentioned.

185. **No. 2 Shop Common**—The sizes admissible in No. 2 Shop Common are: (1) Stiles in width 5 or 6 inches, and from 6 ft. 8 in. to 7 ft. 6 in. in length. (2) Rails 9 or 10 inches in width and from 2 ft. 4 in. to 3 ft. in length. (3) Top rails, 5 inches wide and from 2 ft. 4 in. to 3 ft. in length. Top rails must, however, be of No. 1 Door Cutting quality, but figured as No. 2 Door Cuttings. (4) Muntins, 5 inches wide and from 3 ft. 6 in. to 4 ft. in length. (5) Any number of cuttings of any one of the above sizes are admissible in the grade of No. 2 Shop Common. (6) Each plank of No. 2 Shop Common shall contain either one of the following. At least 25% of No. 1 Door Cuttings, or not less than 40% of all No. 2 Door Cuttings or not less than 33 1-3% No. 1 and No. 2 Door Cuttings combined.

186. **No. 3 Shop Common**—One and one-fourth inches and thicker, will admit all below the grade of No. 2 Shop Common that is of a cutting type, and suitable for sash, door, or other cuttings.

187. **1 inch Factory Select**—This grade shall consist of lumber 5 inches and wider not less than 15/16 inch thick in the rough, containing more than 70% of clear cuttings of the sizes ordinarily used in the manufacture of interior finish.

188. **1 inch Shop Common**—Must be 5 inches and wider, not less than 15/16 inch thick in the rough. Must be of a cutting type to contain not less than 50% nor more than 70% of No. 1 or No. 2 Clear cuttings ordinarily used in the manufacture of interior finish. Cuttings to be 5 inches and wider and 3 feet and longer.

189. All factory plank shall be graded from the poor side, and in determining the percentages of door cuttings, consideration must be given to the fact that plank are to be ripped full length in such manner as will yield the highest grade and largest percentage of door cuttings before cross cutting, except in such cases where plank will yield a higher value by being first cross cut for rails. In such instances as when stock is cross cut for rails, where some of the stock so obtained is

too poor for either No. 1 or No. 2 rails, and yet contains stiles or muntins, or top rails, which can be obtained by ripping this cross cut stock, the door cuttings so obtained shall be figured in when determining percentages.

SPRUCE MOULDING STOCK

190. **Spruce Moulding Stock**—Shall consist of lumber 10 to 18 feet in length, suitable for ripping moulding strips from 1 inch to 6 inches wide. May contain defects, such as pitch pockets and splits, running lengthwise of the piece, or other recognized defects. This grade shall contain not less than 60 per cent of rippings, running 1 inch and wider, 10 feet and longer, 25 per cent of which should average 3 inches and wider, and 80 per cent. to be 12 feet and longer.

SPRUCE TURNING SQUARES

191. **No. 1**—May contain any defects that will dress or turn off; may also contain defects that will cover with paint, such as sound knots, or hard pitch pockets. If surfaced, the size shall be reduced ¼ inch for each side dressed.

"B AND BETTER" CAR SIDING AND ROOFING

192. Will admit small, tight pitch pockets, sound knots up to ½ inch in diameter, or slight roughness in dressing which will cover with paint, making a smooth surface.

SPRUCE BOX LUMBER

193. The value and grade of this lumber is determined from its adaptability for the manufacture of ordinary packing boxes. Ordinary sizes being defined as boxes not over 20 inches in length, nor more than 15 inches in width. Wide boards, or those of special widths, will admit more defects than narrow or random widths. It is not intended that boxes shall be clear, and defects that do not impair the strength or the usefulness of ordinary boxes are not considered, except that if the cuttings are of better quality, a smaller percentage will be accepted in each grade.

194. There shall be three recognized grades of box lumber, i. e., No. 1, No. 2 and No. 3.

195. **No. 1**—Shall be generally sound, and contain from 75 to 90 per cent of cuttings suitable for boxes of ordinary size and quality, as referred to above. In computing percentages, cuttings of assorted size shall be used. Assorted sizes to be defined as pieces running in widths from 6 to 12 inches, and in lengths from 12 to 20 inches.

196. **No. 2**—Generally similar in character to No. 1, containing from 60 to 75 per cent of box cuttings.

197. **No. 3**—Shall consist of all lumber below the grade of No. 2, and shall contain 40 to 60 per cent of box cuttings.

SPRUCE LATH

198. Shall measure three to the inch in thickness and shall not be over 1/16 inch scant in width or ¼ inch scant in length when green. Shall be clean on face, except a small number of pin worm holes. Opposite side may have wane extending not over one-third the width and one-eighth the length of the piece. Season or sap stain shall not be considered a defect.

CEDAR

199. Red Cedar is too well known to require a particular description here. The trade throughout the United States is acquainted with this wood in the form of shingles.

200. As far as decay is concerned, Red Cedar is the most lasting of woods. For this reason it is especially adapted for Shingles, Siding and all outside finish, as well as for many special uses.

NAMES AND GRADES

201. **Flooring**—No. 1 Clear; No. 2 Clear; No. 3 Clear.

202. **Ceiling**—No. 1 Clear; No. 2 Clear; No. 3 Clear.

203. **Corrugated Decking**—No. 2 Clear and Better.

204. **Bevel Siding**—Clear; A; B.

205. **Finish**—No. 1 Clear; No. 2 Clear; No. 3 Clear.

206. **Cedar Flooring**—To be graded the same as Fir Flat Grain Flooring.

207. **Cedar Ceiling**—To be graded the same as Fir Ceiling.

RED CEDAR CORRUGATED DECKING

208. **No. 2 Clear and Better**—To be graded the same as Fir Ceiling.

RED CEDAR BEVEL SIDING

209. **Clear, 4 or 6 inch**—Must be strictly clear, except slight defects on thin edge that will cover when laid.

210. **A, 4 or 6 inch**—Will admit of slight roughness in dressing, sap or other minor defects, but each piece shall be suitable for use the full length without waste. Containing no defects that will not cover with paint, making a smooth surface.

211. **B, 4 or 6 inch**—Will admit all Siding below "A" grade and not impair its utility for cheap siding. Defects such as loose knots or knot holes that can be cut out at a loss of not to exceed 20 per cent of the strip will be allowed.

RED CEDAR FINISH

212. **No. 1 Clear**—4 or 6 inch. Must be strictly clear both sides; 8 inch must be clear on face side, excepting 1 inch of sap or one small knot on reverse side; 10 and 12 inch must be strictly clear on face side, except 1 inch of sap on face side or two small knots on reverse side; 14 inch and wider proportionately more defects.

213. **No. 2 Clear**—4 to 8 inch. Allows the equivalent of 1 inch of sap or two small knots; 10 and 12 inch allows equivalent of 2 inches of sap or four small knots; 14 inch and wider allow proportionately more defects.

WESTERN HEMLOCK

214. Western Hemlock is a wood well adapted to many uses. It is strong, holds nails well, and therefore makes good framing lumber. It is hard and wears well as flooring. It is easily dressed to a smooth surface, and takes a fine polish, which, together with the beauty of grain and color, makes a fine interior finish. The Western Hemlock is entirely free from the "wind shake" so common in the Hemlock of the East. This lumber has been sold in the East under various names, such as "Alaska Pine," "Columbia Pine," "Gray Fir," "Washington Pine," etc., and has given good satisfaction.

215. In a general way the rules for grading Fir and Spruce are applied to Hemlock.

W. R. GRACE & CO.
Pacific Coast Lumber
Red Cedar Shingles and Fir Lath

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Domestic Shipment

TERMS

Sixty (60) Days on Approved Credits—or Two (2) per cent Discount for Cash on F. A. S. price only—in exchange for Documents

Otherwise

Discount pro rata at rate of One per cent per Month for unexpired part of Sixty (60) Days, dating from Delivery at Mill

ABREVIATIONS.

B M.....Board, i. e., 1″ measure
S F.....Superficial feet, same as B. M.
E G.....Edge grain; either vertical or within angle of 45° from vertical
F G.....Flat grain; nearly parallel with surface. Or other than edge grain
Spf'd G....Specified grain; either flat or edge grain, or specified quantities of each as may be ordered
D & M.....Dressed and matched, i. e., surfaced 1 side and T & G edges
Sized.....Sized 1 edge
S 1 E.....Surfaced 1 edge
S 1 S.....Surfaced 1 side
S 1 S 1 E..Surfaced 1 side and 1 edge
S 1 S 2 E..Surfaced 1 side and 2 edges
S 2 S.....Surfaced 2 sides
S 2 S 1 E..Surfaced 2 sides and 1 edge
S 2 S 2 E..Surfaced 2 sides and 2 edges
S 4 S.....Surfaced 4 sides
S 4 S C S..Surfaced 4 sides and 1/16″ calking seam on each edge
A D.....Air dried; this refers to lumber which has been stuck and is as dry as weather conditions permit
K D.....Kiln dried
G.....Green
F A S.....Free alongside; within reach of ship's tackles, not exceeding ninety feet from vessel at loading point
A S 4 S....After surfaced 4 sides

CONDITIONS OF SALE

First. The conditions printed herein shall apply to any and all quotations or contracts or sales made upon or under this price list, or where prices are provided for according to this list, and the prices published herein are not separate from the conditions of sale, unless otherwise expressly agreed, but are issued and published subject thereto only. A contract or sale or quotation, providing for prices according to this list, shall, therefore, carry with it all the provisions of this list, unless otherwise expressly agreed, as the prices are published under that condition only.

Second. Prices named are in U. S. gold coin.

Third. Rates in the following schedule apply to standard assortments, consisting of not less than six (6) listed sizes in at least two (2) listed groups of contiguous random lengths. Random lengths are all lengths in each group, mill run. Odd lengths at shipper's option. Any reference to lengths other than random lengths, as listed herein, shall be construed to mean specified lengths.

Fourth. The seller shall not (unless he has previously been furnished with a specification) be bound to supply without special arrangement, or as provided in the various foot-notes in this schedule:

Sizes and grades not listed
Special lengths in any group
Excessive quantities of any one dimension or of special or long lengths or wide widths

Large quantities of grades, other than No. 1 Common.

Fifth. All dimensions are sold subject to any natural shrinkage, whether "green," partially or wholly seasoned.

Sixth. The quantity, quality and grade shall be determined at loading mill according to the Domestic Grading Rules of the West Coast Lumber Manufacturers' Association, Inc., as set forth herein, by the tally and inspection of a regularly approved inspector licensed by the Pacific Lumber Inspection Bureau, Inc., who, on completion of the loading, shall furnish a certificate of said Bureau, sworn to before a Notary Public, and countersigned by one of the supervisors of said Bureau, certifying to the quantity, character and condition of the shipment at time of delivery to carrier. Such certificate shall be furnished by the manufacturer, one-half the cost of inspection and tally to be charged to the buyer.

Seventh. The certificate mentioned in the foregoing paragraph shall be final and accepted as proof of the character and condition of the cargo at port of shipment.

Eighth. When a quotation is given (without the specification of assortment being known to seller), the price quoted shall apply only to such sizes, lengths and grades in this schedule as take the rate of $20 per 1,000 feet B. M., and as to other sizes, lengths and grades is subject to the same variations from said $20 as appear in this schedule.

When a quotation is requested for an average price, on a specification known to a seller, the price quoted shall apply as an average rate per 1,000 feet B. M. on the entire assortment of lumber.

Ninth. Delivery: Unless otherwise arranged and agreed upon between buyer and seller, delivery will be made to ship at safe port (to be named by seller or his agent) within reach of ship's tackles, according to custom, within ninety (90) feet of vessel, at the average rate of 50 M. feet B. M., or its equivalent, per working day. The act of God, arrest and restraint of Governments and people, civil commotions, floods, fires, strikes, lockouts, accidents to mills and/or docks and/or wharves, and any other hindrances beyond the control of seller or his agents, always excepted.

Tenth. Marking: The cost of marking lumber when required by buyer to be at buyer's expense.

Eleventh. The seller, at his option, may include in his shipments, up to 15% of Hemlock in sizes 1x2 to 4x12, inclusive, in common grades, to be graded and priced under the same rules and prices as apply to Fir, the grade and quantity of Hemlock to be shown on the certificate of inspection.

NOTES TO INSPECTORS

All fractions of a foot in length will measured as of contents of the next lon even length.

All lumber sawn less than one i thickness shall be measured as of one i i. e., surface measure.

All rough lumber, one inch and over thickness, shall be measured at board me ure contents.

All worked or surfaced lumber shall measured at the board measure conte before working.

Stock shall be worked as follows as thickness:

1 inch surfaced one side to 13/16"
1 inch surfaced two sides to ¾"
Over 1 inch to 4 inches, inclusive, ¼"
Over 4 inches, ½" off

Stock shall be worked as follows as widths:

6 inches and under, ¼" off
Over 6 inches ½" off

Tongued and grooved, surfaced one sid green or seasoned, will be worked acco ing to official patterns for worked sizes cluded in this list.

In "Kiln Dried" or "Air Dried" sto bright sap is not considered a defect, e cept as hereinafter provided.

When an inspector receives instructio to grade a shipment according to any ru contained in this list he will grade strict according to the rule specified, unless s cial instructions are shown, by contrac between buyer and seller. Such speci grading to be noted on certificate of i spection.

Enumerated defects permissible in an grade are intended to be descriptive of th coarsest piece such grade may contain.

All lumber shall be graded from the bes side except Factory Lumber.

All dimensions are sold subject to an natural shrinkage, whether green, partiall or wholly seasoned. As it is a well know fact that all lumber does not shrink alike therefore when seasoned lumber is shipped especially so in the grade of Clears, it will at the time of loading, be considered by the Supervisor and Inspector whether i will work to the dry standard in its size in accordance with the official patterns fo worked sizes, included in this list.

RECOGNIZED DEFECTS

Are Knots, Knot holes, Splits, Sh Wane, Rot, Rotten streaks, Worm Pitch seams, Pitch pockets, Solid Chipped grain, Torn grain, Loosened Black sap and Heart stain.

KNOTS

Shall be classified as Pin, Small, Standard and Large as to size; Round and Spike as to form; and Sound, Loose, Encased, Pith and Rotten as to quality.

A Pin knot is sound and not over ½ inch in diameter.

A Small knot is sound and not over 1 inch in diameter.

A Standard knot is sound and not over 1½ inches in diameter.

A Large knot is sound, and any size over 1½ inches in diameter.

A Round knot may be oval or circular in form, and the mean or average diameter shall be considered in applying these rules.

A Spike knot is one sawn in a lengthwise direction.

A Sound knot is one solid across its face, as hard as the wood it is in, and so fixed by growth or position that it will retain its place in the piece.

A Loose knot is one not held firmly in place by growth or position.

An Encased knot is one surrounded wholly or in part by bark or pitch.

A Pith knot is a small sound knot with the pith hole not more than ¼ inch in the center.

PITCH

Pitch seams or Pitch shakes are well defined openings between the grain of wood containing more or less pitch; either granulated or liquid.

PITCH POCKETS

A Pitch pocket is a well defined accumulation of pitch at any place in the piece.

A large pitch pocket is one ⅛ inch and over in open width and over 8 inches in length.

A medium pitch pocket is one ⅛ inch in open width, over 4 inches but not over 8 inches in length.

A small pitch pocket is one less than ⅛ inch in open width, and not exceeding 4 inches in length.

A pitch pocket showing open on both faces of the piece ⅛ inch or more in width shall be considered the equivalent of a knot.

GRAIN

Chipped grain consists of a part of the surface being chipped or broken out in small particles below the surface, but shall not be classed as torn grain.

Torn grain consists of a part of the wood torn out in dressing, usually around knots or curly places.

Loosened grain consists of the point of one grain being torn loose from the next grain, noticeable on the heart side of a piece.

Firm grain consists of solid wood between the annular rings, or with the annular rings close together.

Edge grain shall be so graded when it shows grain on edge for one-half of width.

SAP

Colored, blue or black.

Bright sap shall not be considered a defect, in any of the grades, except as specially provided for in the following rules.

SUNDRIES

Slight variations in sawing shall not be considered a defect when not rendering the piece unfitted for ordinary use.

Imperfect manufacture in dressed stock, such as Chipped grain, Torn grain, Loosened grain, Broken knots, Mismatching, or Insufficient tongue or groove will reduce the grade, according to whether such defects are slight or serious in their effect upon the use of the piece.

Equivalent, in the application of these rules, means that the defects allowed, whether specified or not, are understood to be equivalent in damaging effect to those specially mentioned.

The grades of all regular stock shall be determined by the number, character and position of defects visible in any piece.

FIR GRADING RULES

Hemlock shall be graded under these rules when sold or shipped under paragraph No. 11, conditions of sale.

Green Rough Clears

No. 1 Flooring Strips must be firm, edge grain stock, sound and well sawn. Will allow bright sap green or seasoned one-quarter the width and one-half the length, otherwise must be free from defects on one face and two face corners. Angle of grain not more than 45 degrees from vertical.

No. 2 Flooring Strips must be edge and/or flat grain, sound and well sawn. Will allow bright sap on one-half the width of face or from one to three small, close pitch pockets, each not to exceed 2 inches in length, that do not extend through the piece, or from one to three tight pin knots when not appearing on face corners, or their equivalent of combined defects. Based on 16-foot lengths.

Ceiling and Rustic Stock

No. 2 Clear and Better shall be sound and well sawn, edge and/or flat grain stock admissible. Will allow bright sap when not exceeding one-third width or length, three close pitch pockets, each not more than 2 inches in length, three tight pin knots if not appearing on face corners, or their equivalent of combined defects. Based on 16-foot lengths.

Finish Stock

No. 2 Clear and Better shall be sound and well sawn, edge and/or flat grain stock admissible. Will allow bright sap when not exceeding one-quarter the width, thickness or length; in addition one of the following shall be permitted: three tight pin knots, one tight small knot, three to four small, close pitch pockets that do not extend through the piece, each not more than 2 inches in length, or their equivalent of combined defects. Rules to apply proportionately on narrower and wider stock. Based on 1x12 16-feet.

Edge Grain Clears in width 10 inches and wider must be of sound, firm grain, well sawn and shall show edge grain on face for at least one-half of width. Will allow bright sap one-quarter the width and length, otherwise must be free from defects on one face and two face corners.

Flat Grain Clears must be of sound, firm grain, well sawn. Will allow bright sap one-quarter the width and length, otherwise must be free from recognized defects on one face and two face corners.

Other Clears shall be sound, firm grained lumber, well sawn.

Will Allow

In dimensions two inches and less in thickness, of contents 24 inches or less to the linear foot; narrow pitch pockets not over 4 inches long, when not extending through the piece and small knots when appearing on one side only. Small amount of bright sap when not exceeding one-quarter the width or length.

In dimensions 3 to 6 inches thick, 6 to 10 inches wide; narrow pitch pockets not over 6 inches long, that do not extend through the piece and on one side or edge.

Light colored sap not exceeding one-quarter face or edge or one-half the length.

Knots not exceeding 1 inch in diameter when on one side and lower half of edges.

In dimensions larger than above:

Pitch pockets not over 6 inches long.

Light colored sap on corners not exceeding 3 inches on face and edge.

Knots 2 inches and less in diameter, according to size of piece, when on one face and one-half of each corresponding edge leaving one face and upper half of each edge clear.

No. 3 Clear

Flooring, Ceiling, Rustic and Finish Stock shall be sound, strong lumber, well manufactured.

Will Allow

Three tight, sound 1-inch knots or equivalent of smaller knots, if not appearing on face corners.

Eight small pitch pockets or four medium pitch pockets, each not over 6 inches in length, or equivalent of combined defects.

Other Sizes in this grade will allow:

In sizes under 6x6:

Small, sound knots, small or medium pitch pockets if not over 6 inches in length.

In sizes 6x6 and over:

Small and Standard knots varying according to size of piece, medium and small pitch pockets.

Defects in all cases to be considered in connection with size of piece and its general quality.

Selected Common

This is a grade selected from the grade of No. 1 Common, and shall consist of lumber free from defects that materially impair the strength of the piece, well manufactured and suitable for high class constructional and structural purposes or the purpose for which it is intended, including bridge timbers, floor joists, ship timbers, factories and warehouses, designed to carry heavy loads, etc.

No. 1 Common

This grade shall consist of lengths 8 feet and over (except shorter lengths be ordered) of a quality suitable for ordinary constructional purposes. Will allow small amount of wane, large sound knots, large pitch pockets, colored sap one-third the width and one-half the thickness, slight variation in sawing and slight streak of solid heart stain.

Defects to be considered in connection with the size of the piece.

Discoloration through exposure to the elements or season checks not exceeding in length one-half the width of the piece shall not be deemed a defect excluding lumber from this grade, if otherwise conforming to the grade of No. 1 Common.

No. 2 Common

This grade shall consist of lumber 6 feet and over (except shorter lengths be ordered) having defects that prevent it being graded as No. 1 Common, but must be suitable for a cheaper class of construction than the preceding grade.

Will admit large coarse knots, knot holes and splits that do not render the piece unfit for use; colored sap, or wane on corner leaving a fair nailing surface, worm holes, large pitch pockets and solid heart stain one-half the piece.

No. 3 Common

This grade will admit all stock below the grade of No. 2 Common, such as shakes, large coarse knots, rotten knots, knot holes, splits, excessive mouldy sap stock, heart stain in any amount, streak of white specked heart stain or scattered small rotten spots, sap rot and worm holes.

This grade shall be either Fir, White Fir, Hemlock or Spruce or a combination of all at seller's option.

No. 1 Ship Plank

Including Outboard Planking, Garboards, Wales, Clamps, Rails and lumber for similar purposes, shall be firm grain, free from large knots or other defects impairing its use for the purposes intended.

Will allow small, tight, hard knots when not on face corners or calking seam. Bright sap on face side edges not exceeding one-quarter the width or thickness. Small pitch pockets not extending through the piece. Laid defects to be considered in connection with size of piece and its quality otherwise. Must be well sawn.

No. 2 Ship Plank

This grade shall include material not suited for grading as No. 1, but shall conform generally to the grade of "Selected Common." Must be well sawn.

Decking

Shall be uniformly sawn, firm grain and free from knots and defects on one face and calking edges. Flat sizes shall show edge grain on broad face. Will allow pin and small knots on under side and lower part of calking edges. Bright sap, whether green or seasoned, on face side corner not exceeding one-quarter the width or one-third the length.

CAR SIDING AND ROOFING

Master Car Builders' Rules

No. 2 Clear and Better Edge Grain

Material of this grade shall be well manufactured with angle of grain not less than forty-five degrees. This stock shall be kiln-dried and practically free from all defects, but will admit of bright sap on the face; not exceeding three small close pitch pockets not over 2 inches long, one pin knot, slight roughness in dressing, but not a serious combination of these defects.

No. 2 Clear and Better Flat Grain

Material of this grade shall be well manufactured. The stock shall be kiln-dried and practically free from all defects, but will admit of bright sap on the face; not exceeding three small close pitch pockets not over 2 inches long, one pin knot, slight roughness in dressing, but not a serious combination of these defects.

No. 3 Clear

Material of this grade should be sound common lumber and will admit of roughness in dressing, bright sap, and also may contain five pin, three ¾ inch knots and one standard knot and five pitch pockets in any continuous 5 feet of length of the piece; or any combination of tight knots or pitch pockets equivalent to those mentioned above. This grade particularly refers to stock used for inside lining of freight cars.

FACTORY LUMBER

Grades as described under this head are valued for cutting up qualities only and should not be confounded either in quality or value with grades outlined for yard purposes.

Factory Lumber of all kinds shall be graded for the percentage of clear cuttings obtainable.

Select and Better

Shall consist of lumber containing 80 per cent or more of clear cuttings of sizes ordinarily used in the manufacture of doors.

No. 1 Shop Common

Shall consist of 8-inch and wider, excepting that 6-inch pieces containing one or more Stiles are admitted. This grade shall

contain not less than 50 per cent and up to 80 per cent of clear cuttings ordinarily used in the manufacture of doors.

No. 2 Shop Common

Shall be of the same width as No. 1 Shop Common and shall contain not less than 25 per cent or more than 50 per cent of clear cuttings ordinarily used in the manufacture of doors.

No. 3 Shop Common

Will admit all below the grade of No. 2 Shop Common that is of a cutting type and suitable for sash, door and other cuttings.

One-inch Factory Select

Shall consist of lumber 5 inches and wider not less than 15/16 inch thick in the rough, containing not less than 80 per cent of clear cuttings of the size ordinarily used in the manufacture of Interior Finish.

Inch Shop Common

There shall be but one grade of inch Shop Common. Each piece must contain not less than 50 per cent of clear cuttings 5 inches and wider, 3 feet and longer.

FLOORING

Fir Flooring No. 1 Edge Grain, shall be free from all defects on face and two face corners, except bright sap, green or seasoned, one-quarter the width and half the length; must be well manufactured. Angle of grain not more than 45 degrees from vertical.

Fir Flooring No. 2. Shall be well manufactured, both edge and/or flat grain. Will admit of slight roughness in dressing, bright sap, green or seasoned, one-half the width of face. One of the following is also permitted with one of the above two defects: Three close pitch pockets, each not over 2 inches in length, that do not extend through the piece; three tight, smooth knots, each not more than ¾ inch in diameter. Based on 16-foot lengths.

Fir Flooring No. 3. This grade shall conform generally to the grade of "Selected Common."

STEPPING

Stepping No. 1. Shall be graded from best side and show edge grain on face to extent of not less than one-half of width and be generally free from defects on one face and one face corner. Must be well manufactured and may contain bright sap one-quarter the width; in absence of sap, a piece may contain small, close pitch pockets, each not over 2 inches long, one such for each 4 linear feet. In absence of both of the above defects a piece may contain a defect 4 feet or more from the end, that will cut out with a loss of not more than 2½ inches in its length.

Stepping No. 2. Must be well manufactured and shall show edge grain on face to extent of not less than one-half of width. Will admit of slight roughness in dressing, bright sap one-third the width, or small, close pitch pockets, or tight pin knots, or their equivalent of combined defects. The riser edge may have knots and/or pitch pockets and/or sap or combined defects, if such defects do not show more than 1½ inches on face of piece. In absence of the above defects a piece may contain two defects that will cut out with a loss of not more than 4 inches in the length of piece. Such cuttings must be 4 feet or longer and have one face and two face corners free from defects.

Stepping No. 3. This grade shall be regardless of grain and conform generally to the grade of "Selected Common."

RUSTIC

No. 2 Clear and Better. Shall be well manufactured, either edge and/or flat grain. Will allow slight roughness in dressing, three tight, smooth pin knots or four tight pitch pockets, or their equivalent of combined defects. Based on 1x6—16 feet.

No. 3 Clear. Will admit roughness in dressing, three or four tight, smooth, small knots or six small, close pitch pockets or their equivalent of combined defects. Based on 1x6—16 feet.

CEILING

No. 2 Clear and Better. Shall be well manufactured, either edge and/or flat grain. Will admit slight roughness in dressing. With the above either of the following will be permitted: Three close pitch pockets, each not to exceed 2 inches in length; three tight, smooth pin knots, if not appearang on face corners, or their equivalent of combined defects. Based on 16-foot lengths.

No. 3 Clear. Edge and/or flat grain. Will admit roughness in dressing. 4-inch stock admits of not to exceed four tight knots ¾ inch in diameter or two knots 1 inch in diameter, or three open pitch pockets not to exceed 4 inches each in length

or the same number of tight pitch pockets, or their equivalent of combined defects. Based on 1x4—16 feet.

CROSS ARM STOCK

Must be sound, straight grained lumber, well sawn. Will allow small close pitch pockets that do not extend through the piece and sound, tight pin knots if well scattered; must be suitable for the purpose intended.

MINING TIMBER

No. 1. This grade shall consist of lumber free from serious shakes, splits or rot. Will allow variations in sawing, sap stain, solid heart stain extending over not more than half of piece, large knots, a few well scattered worm holes, and wane 3 inches on one corner or its equivalent on two or more corners. Will admit 15% Hemlock.

No. 2 shall conform generally to the grade of No. 3 Common.

RAILROAD TIES

No. 1 Ties must be cut square, free from stain, rot, large shakes and large knots where the rails lie. Will allow wane on one corner that does not reduce face width more than 1 inch, slight variation in sawing.

No. 2 Ties must be free from rot. Will allow defects such as shakes, that do not render the piece unfit for Tie purposes, knots, solid heart stain, wane on one corner that does not reduce face width more than 2 inches or its equivalent on two or more corners, variation in sawing or such other defects as would exclude it from grading No. 1.

CAR STAKES

Fir and/or Hemlock 3x4, 4x4, 4x5 and 4x6 must be suitable for such purposes. Will allow slight variation in sawing, pitch pockets, knots that do not seriously impair the strength of the piece, solid heart stain, slight wane on one or more corners.

LATH

Three thicknesses to one inch.

Will allow sap stain, slight wane, a few worm holes and/or pin knots. Hemlock, Spruce and Fir allowed.

PICKETS

1x3 inches x 4 feet or longer. No. 1 will allow variation in size of ⅛ inch in thickness and ⅛ inch in width, pitch pockets and two sound hard knots not over 1 inch in diameter.

No. 2. Will allow variation in size of ⅛ inch in thickness and ¼ inch in width, sap stain, pitch pockets, slight wane on one corner, two sound knots not to exceed 1⅛ inch in diameter or two 1-inch knots and two pin knots.

WIDTHS OF SEASONED ROUGH FINISH STOCK AT TIME OF SHIPMENT.

4″	must	measure	at least	3¾″	in width
5″	“	“	“	4¾″	“
6″	“	“	“	5¾″	“
8″	“	“	“	7½″	“
10″	“	“	“	9½″	“
12″	“	“	“	11½″	“
14″	“	“	“	13¼″	“
16″	“	“	“	15¼″	“

SPRUCE

Description: Western Spruce is a soft white wood, both odorless and tasteless in nature. It takes paint freely, consequently has few equals for Bevel Siding, Finish, Sash and Door Stock and many other specialties.

General Instructions: Spruce Lumber shall be graded and classified according to the following rules and specifications as to quality, and dressed stock shall conform to the table of standard sizes, except where otherwise expressly stipulated between buyer and seller.

There being but a limited amount of sap wood in Spruce, bright sap in any grade shall not be a defect.

Shipments of Rough Clear lumber by cargo shall include the usual percentage of Selects accumulating in manufacture.

NAMES AND GRADES

Flooring: Clear. “A.” “B.”
Ceiling: Clear. “A.” “B.”
Partition: Clear. “A.” “B.”
Wainscoting: Clear. “A.” “B.”
Porch Decking: Clear. “A.” “B.”
Bevel Siding: Clear. “A.” “B.” “C.”
Finishing: First and Second Clear. Third Clear, Select.
Factory Lumber: Select and Better. No. 1 Shop. No. 2 Shop, Inch Shop.
Moulding Stock: One grade only.
Turning Squares: One grade only.
Car Siding and Roofing: One grade only.
Box Lumber: No. 1. No. 2. No. 3.

FLOORING

Clear shall be free from all defects on face.

"A" will admit two slight defects in dressing or three close pitch pockets not to exceed 2 inches each in length.

"B" will admit of slight roughness in dressing or four close pitch pockets not to exceed 3 inches each in length, or two small round knots, not to exceed ½ inch in diameter.

CEILING

Clear shall be practically free from all face defects.

"A" will admit of two slight dressing defects, or close pitch pockets not to exceed a combined length of 6 inches.

"B" will admit slight roughness in dressing or close pitch pockets not to exceed a combined length of 12 inches, two sound knots not exceeding ½ inch in diameter.

PARTITION

Shall be graded same as Ceiling, on one face side, with reverse side not more than one grade lower.

WAINSCOTING

Shall be graded same as Ceiling.

PORCH DECKING

Shall be graded same as Flooring.

BEVEL SIDING

Clear shall be practically free from defects; will admit of very slight defects on thin edge, which will cover when laid.

"A" will admit of slight defects in dressing, or two close pitch pockets not over 2 inches each in length or other minor defects, but each piece shall be suitable for use the full length without waste, containing no defects that will not cover with paint, making a smooth surface.

"B" will admit of knots up to ½ inch in diameter, small pitch pockets, roughness in dressing or other recognized defects, not to exceed four of any of the said defects, or their equivalent, in any one piece.

"C" will admit all Siding below a "B" grade, and may contain any of the recognized defects, provided any piece can be used for the purposes intended, with a waste not exceeding 15 per cent.

FINISH

First and Second Clear, being the highest grade in Spruce Finish, shall be free from serious defects, and capable of use for finishing work without waste.

May be of any width or length, and if under 10 inches in width, shall be free from defects. If 10 inches or over, will admit slight defects, such as roughness in dressing.

Third Clear will admit of sound knots not over ½ inch in diameter, slight roughness in dressing, small close pitch pockets, or other minor defects. In widths under 12 inches there shall not be more than three of said defects to any one piece.

Select will admit of sound knots up to 1 inch in diameter, roughness in dressing, close pitch pockets not over 4 inches long, or other proportionate defects. In widths 12 inches or less there shall not be more than four of said defects to any one piece.

FACTORY LUMBER

Grades as described under this head are valued for cutting up qualities only and should not be confounded either in quality or value with grades outlined for yard purposes.

Factory Lumber of all kinds shall be graded for the percentage of clear door cuttings obtainable.

Factory Lumber shall be 8 inches and wider, and 8 to 20 feet long.

Select and Better: This grade shall consist of all lumber containing more than 80 per cent of clear cuttings of the sizes ordinarily used in the manufacture of doors.

No. 1 Shop shall be 8 inches and wider, excepting that 6 inch pieces containing one or more stiles are admissible.

This grade shall contain not less than 50 per cent, nor more than 80 per cent, of Clear Cuttings of the sizes ordinarily used in the manufacture of doors.

No. 2 Shop shall be of the same widths as No. 1, and shall contain not less than 25 per cent, nor more than 50 per cent, of Clear Cuttings of the sizes ordinarily used in the manufacture of doors.

Inch Shop Common: There shall be but one grade of Inch Shop Common. Each piece must contain not less than 50 per cent. of cuttings 6 inches and wider, 3 feet and longer.

MOULDING STOCK

Shall consist of lumber 10 to 18 feet in length, suitable for ripping moulding strips from 1 inch to 6 inches wide. May contain defects, such as pitch pockets and splits, running lengthwise of the piece, or other recognized defects.

This grade shall contain not less than 60 per cent. of rippings, running 1 inch and wider, 10 feet and longer, 25 per cent. of which should average 3 inches and wider, and 80 per cent. to be 12 feet and longer.

TURNING SQUARES

No. 1 may contain any defects that will dress or turn off; may also contain defects that will cover with paint, such as sound knots, or hard pitch pockets, etc. If surfaced, the size shall be reduced ¼ inch for each side dressed.

B AND BETTER CAR SIDING AND ROOFING

Will admit small tight pitch pockets, sound knots up to ½ inch in diameter, or slight roughness in dressing which will cover with paint, making a smooth surface.

BOX LUMBER

The value and grade of this lumber is determined from its adaptability for the manufacture of ordinary packing boxes. Ordinary sizes being defined as boxes not over 20 inches in length, nor more than 15 inches in width. Wide boards, or those of special widths, will admit more defects than narrow or random widths. It is not intended that boxes shall be clear, and defects that do not impair the strength or the usefulness of ordinary boxes are not considered, except that if the cuttings are of better quality, a smaller percentage will be accepted in each grade.

There shall be three recognized grades of box lumber, i. e., No. 1, No. 2, and No. 3.

No. 1 shall be generally sound, and contain from 75 to 90 per cent. of cuttings suitable for boxes of ordinary size and quality, as referred to above. In computing percentages, cuttings of assorted sizes shall be used. Assorted sizes to be defined as pieces running in widths from 6 to 12 inches, and in lengths 12 to 20 inches.

No. 2: Generally similar in character to No. 1, containing from 60 to 75 per cent. of box cuttings.

No. 3 shall consist of all lumber below the grade of No. 2, and shall contain 40 to 60 per cent. of box cuttings.

Specified Widths: Whenever Spruce Box Lumber is ordered of specific width, then the cuttings used in computing percentages shall be of the same widths as the lumber ordered. In this case the percentage of each grade shall be 15% less; that is, No. 1 Box shall contain 60% or more of cuttings; No. 2 Box shall contain 45% to 60% and No. 3 shall contain 25% to 45%.

PORT ORFORD CEDAR

The wood is almost white, having a yellowish tinge with a very slight trace of red. It is rather hard, straight, even grained, tough, decidedly odorous and extremely durable. In addition, it works similarly to the finest white pine and does not lose its shape after manufacture.

For sash and door stock, row boat lumber and similar uses where a light, strong, durable and easily worked wood is desired, this cedar is second to none. Its straight grain and the facility with which it is worked gives this wood a high place among those used for match and pattern making. Because of the aroma exuded from the wood it is highly desired for use in the manufacture of moth-proof chests and drawers, and for this purpose is preferred to Western red cedar.

NO. 1 AND 2 CLEAR

One inch and thicker is sold both grades combined. Should contain at least 25 per cent. No. 1 Clear; balance No. 2 Clear.

NO. 1 CLEAR

Eight inches and wider, 10 feet and longer.

Free of all defects on face side, except will allow 10 per cent. bright sap.

NO. 2 CLEAR

Eight inches and wider, 10 feet and longer.

Free of all defects on face side, except will allow 25 per cent. bright sap or oil streak, occasional sound knots not exceeding ½ inch diameter. Will allow one such defect to eight linear feet on 12 inches wide and under. Wider widths proportionately.

Example No. 2 Clear: Pieces 1x8 to 12 inches, 16 feet. Is perfect on one side, ex-

cept may contain 25 per cent. bright sap or oil streak, and two sound knots ½ inch in diameter.

Pieces 13 to 18 inches, 16 feet, may contain 25 per cent. bright sap or oil streak, one knot 1½ inches in diameter or two knots ¾ inch diameter.

Pieces 20 inches or wider may contain three knots 1½ inches in diameter or six ¾ inch or twelve ½ inch knots.

NO. 3 CLEAR OR FACTORY C

Eight inches and wider.

This grade is intended for special work where large cuttings are required and should cut not less than 70 per cent. or more than 85 per cent. of No. 1 Door Cuts.

NO. 1 AND 2 CLEAR STRIPS

1x3, 1x4 and 1x6 wide, 10 feet and longer, to be graded for Siding, Flooring, Ceiling and Finish. Will allow any amount of bright sap; other defects to be considered the same as in 8 inch and wider.

SELECTS

1x3 to 1x12, 10 feet and longer.

This is a grade of one face finishing lumber and will admit of several small defects; two or three knots from ¾ inch to 1¼ inches in diameter, small amount of wane, sticker stain or stained sap on one side of piece.

Example No. 1: Piece 1x3 or 1x4, 10 feet and longer, will allow any amount of bright sap on face or stained sap on back.

Example No. 2: Piece 1x6 to 1x12, 10 feet and longer, bright or slightly discolored sap on one or two sides or occasional small sound knots that do not detract from appearance of piece.

SHOP COMMON

The sizes and grades of cuttings admissible in the grades of No. 1 and No. 2 Shop Common are as follows:

1¼ inches and thicker; 6 inches and wider, No. 1 and No. 2 Shop.

Factory lumber of all grades shall be graded from poor side for the percentage of door cuttings that may be obtained.

Two grades of door cuttings only shall be recognized and are to be known as No. 1 and No. 2 Cuttings.

No. 1 Cuttings to be free from all defects except white sap.

No. 2 Cuttings will admit of one defect in each piece, i. e., one sound knot ⅝ inch in diameter, or slightly stained sap or oil streak on one side extending over not to exceed one-half of the piece.

Sizes: No. 1 Stiles, 5 and 6 inches wide by 6 feet 8 inches to 7 feet 6 inches.

No. 1 Rails, 9 and 10 inches wide by 2 feet 4 inches to 3 feet.

No. 1 Muntins, 5¼ inches wide by 3 feet 6 inches to 4 feet.

NO. 1 SHOP

Any number of pieces of either Stiles or Rails are admissible in the grade of No. 1 Shop, but only 2 Muntins shall be considered; 1 No. 2 Door Stile may also be included in securing the required percentage of cuttings. Each piece of lumber shall contain not less than 50 per cent. or more than 70 per cent. of the sizes and grades above mentioned.

NO. 2 SHOP

Each piece of lumber must contain: 25 per cent. No. 1 Door Cuttings, or 40 per cent. No. 1 and No. 2 Door Cuttings, or 50 per cent. No. 2 Door Cuttings.

Example: Piece 6 inches wide, 16 feet long: 1 No. 2 Stile or 2 No. 2 Rails, or 1 No. 2 Rail and 2 No. 2 Muntins.

Piece 12 inches wide, 16 feet long: 1 No. 1 Stile and 1 No. 2 Muntin; 1 No. 2 Stile and 2 No. 1 Rails; 2 No. 1 Rails and 2 No. 2 Muntins; 2 No. 2 Stiles and 1 No. 2 Rail; 3 No. 2 Rails and 1 No. 2 Muntin.

DRESSING

Four inches and wider, 10 feet and longer.

This grade shall contain any number of small pin knots or lesser number of knots ½ inch in diameter well scattered throughout piece. Sap, bright or stained, no defect.

SHELVING

Thirteen inches and wider, 10 feet and longer.

This grade shall contain one or two clear edges excepting sap; otherwise the same as dressing grade.

COFFIN BOX

Thirteen inches and wider, 8 feet and longer.

Coarse sound knotted common.

SHOP COMMON

1x6 and wider.

Cuttings shall be 10 inches wide or wider, 22 inches long or longer, or 6 inches wide or wider and 3 feet long or longer. Each piece to contain 50 per cent. or more of cuttings described.

COMMON LUMBER

The characteristics of Common Lumber, as distinguished from Finishing Lumber, consist of a general coarseness of appearance caused by various defects and combinations of defects in a greater or less degree, according to the grade.

No. 1 Common Boards and Strips include all sound, small tight-knotted stock and a small amount of stained sap, knots varying in size from ½ to 1¼ inches.

No. 2 Common Boards and Strips are subject to same general inspection as No. 1, except that coarser and larger knots, and more stained sap are allowed. "V" and coarse firm limb knots also admissible in this grade.

No. 3 Common Boards and Strips include large, loose or unsound knots, an occasional knot hole, some shake, some red rot and any amount of blue sap. A serious combination of these defects in any one piece is not admissible.

THICK COMMON LUMBER

General Rule: Common lumber, 1¼ inches and thicker, shall be graded the same as 1-inch lumber.

TANK STOCK

Tank Stock shall be of dimension sizes, square edged, practically free from wane and having any quantity of sound, watertight knots. White sap is no defect.

WHARF PLANKING

Two inches, 3 inches and 4 inches thick, 6 inches and wider, 8 feet long and longer, should have one sound face. Will allow knots and other defects same as are included in No. 2 Common Boards.

RED CEDAR

Red Cedar is too well known to require a particular description here. The trade throughout the United States is acquainted with this wood in the form of shingles.

As far as decay is concerned, Red Cedar is the most lasting of woods. For this reason it is especially adapted for Shingles, Siding and all outside finish, as well as for many special uses.

NAMES AND GRADES

Flooring. No. 1 Clear. No. 2 Clear. No. 3 Clear.

Ceiling. No. 1 Clear. No. 2 Clear. No. 3 Clear.

Corrugated Decking. No. 2 Clear and Better.

Bevel Siding. Clear. "A." "B."

Finishing. No. 1 Clear. No. 2 Clear. No. 3 Clear.

FLOORING

To be graded the same as Fir Slash Grain Flooring.

CEILING

To be graded the same as Fir Ceiling.

CORRUGATED DECKING

No. 2 Clear and Better. To be graded the same as Fir Ceiling.

BEVEL SIDING

Clear 4 or 6-inch. Must be strictly clear, except slight defects on thin edge that will cover when laid.

"A," 4 or 6-inch. Will admit of slight roughness in dressing, sap or other minor defects, but each piece shall be suitable for use the full length without waste. Containing no defects that will not cover with paint, making a smooth surface.

"B," 4 or 6-inch. Will admit all Siding below "A" grade and not impair its utility for cheap siding. Defects such as loose knots or knot holes that can be cut out at a loss of not to exceed 20 per cent. of the strip will be allowed.

FINISHING

No. 1 Clear. 4 or 6-inch. Must be strictly clear both sides; 8-inch must be clear on face side, excepting 1 inch of sap or one small knot on reverse side; 10 and 12-inch must be strictly clear on face side, except 1 inch of sap on face side or two small knots on reverse side; 14 inch and wider proportionately more defects.

No. 2 Clear. 4 to 8-inch. Allows the equivalent of 1 inch of sap or two small knots; 10 and 12-inch allow equivalent of 2 inches of sap or four small knots; 14 inch and wider allows proportionately more defects.

RED CEDAR SHINGLES

Perfection-18". Variation of 1", under or over, in length, allowed in 10 per cent. Random widths, but not narrower than 3". When dry 20 courses to measure not less than 8¾". To be well manufactured. 97 per cent. to be clear, remaining 3 per cent. admits slight defects 16" or over from butt.

Puget A-18". Random widths, but not narrower than 2". When dry, 20 courses to measure not less than 8¼". Admits feather tips and 16" shingles resulting from shims, and other defects 8" or over from butt.

Eureka-18". Variation of 1", under or over, in length allowed in 10 per cent. Random widths, but not narrower than 3". When dry, 25 courses to measure not less than 9¾". To be well manufactured. 90 per cent. to be clear, remaining 10 per cent. admits slight defects 14" or over from butt.

Skagit A-18". Random widths, but not narrower than 2". When dry, 25 courses to measure not less than 9¼". Will admit feather tips, and 16" shingles resulting from shims, and other defects 8" or over from butt.

Extra Clear-16". Variation of 1", under or over, in length, allowed in 10 per cent. Random widths, but not narrower than 2½". When dry, 25 courses to measure not less than 9½". To be well manufactured, 90 per cent. to be clear, remaining 10 per cent. admits slight defects 12" or over from butt.

Choice A-16". Random Widths, but not narrower than 2". When dry, 25 courses to measure not less than 9". Admits wane and 12" shingles resulting from shims, and other defects 6" or over from butt.

Extra *A*-16". Variations of 1", under or over, in length, allowed in 10 per cent. Random widths, but not narrower than 2". When dry, 25 courses to measure not less than 7¾". To be well manufactured. 80 per cent. to be clear, remaining 20 per cent. admits defects 10" or over from butt. If not to exceed 2 per cent. (in the 20 per cent. allowing defects 10" from butt) shows defects closer than 10", the shingles shall be considered up to grade.

Standard A-16". Random widths, but not narrower than 2". When dry, 25 courses to measure not less than 7½". Admits wane and 12" shingles resulting from shims, and other defects 6" or over from butt.

PACKING

All shingles to be packed in regulation frame 20" in width.

Openings shall not average more than 1½" to the course.

Perfection and Puget A shall be packed 20-20 courses to the bunch, 5 bunches to the M.

Eureka, Skagit A, Extra Clear, Choice A, Extra *A*, Standard A (Dimension shingles excepted), shall be packed 25-25 courses to the bunch, 4 bunches to the M.

Dimension shingles (5") shall be packed 24-24 courses to the bunch, 4 bunches to the M.

The character "M" indicates the multiple or unit by which Red Cedar Shingles are bought and sold.

Every bunch shall be branded with full name of the grade as stated in these rules.

Color of wood and sound sap shall not be considered defects.

Percentage, when specified in these rules, applies in a general way to the total amount of shingles of like grade in a car.

PACIFIC LUMBER

INSPECTION BUREAU

Incorporated

STANDARD GRADING RULES, ETC

of

DOUGLAS FIR LUMBER

List for

Export Shipment

CONDITIONS OF SALE

In any offer, bargain or sale made on the basis of this list the following conditions are understood and accepted by both parties as forming a part of the contract between buyer and seller:

1. The rates in the following schedule shall apply to ordinary assortments usually shipped to foreign markets, i. e., consisting of fair average quantities of sizes in all usual lengths. Random lengths are all lengths in each group, mill run. Odd lengths at shipper's option.

2. The seller shall not (unless he has previously been furnished with a specification) be bound to supply without special arrangement, or as provided in the various foot notes in this schedule:

Sizes and grades not listed.

Special lengths in any group.

Excessive quantities of any one dimension or of special or long lengths or wide widths.

Large quantities of grades, other than merchantable.

3. All dimensions are sold subject to any natural shrinkage, whether "green," partially or wholly seasoned.

4. The quantity, quality and grade shall be determined at loading mill according to the Grading Rules of the Export Branch of the West Coast Lumber Manufacturers' Association, as set forth herein by the survey and inspection of a regularly approved inspector licensed by the Pacific Lumber Inspection Bureau, Inc., who, on completion of the loading, shall furnish a certificate of said Bureau, sworn to before a Notary Public, and countersigned by one of the supervisors of said Bureau, certifying to the quantity, character and condition of the shipment. Such certificate shall be furnished by the loading mill.

5. The certificate mentioned in the foregoing paragraph shall be accepted as proof of the character and condition of the cargo at port of shipment and shall relieve the shipping mill from any responsibility for impairment of condition or otherwise occurring in transit, although the cargo is shipped "unseasoned," unless otherwise provided by special contract.

6. When a quotation is given (without the specification of assortment being known to seller), the price quoted shall apply only to such sizes, lengths and grades in this schedule as take the rate of $20 per 1000 feet B. M., and as to other sizes, lengths and grades is subject to the same variations from said $20 as appear in this schedule.

When a quotation is requested, for an all round price, on a specification known to a seller, the price quoted shall apply as an average rate per 1000 feet B. M. on the entire assortment of lumber. Prices named are all in U. S. Gold Dollars.

When a C. I. F. price is given, it is understood that the cargo will be insured under ordinary San Francisco or English form of policy, as buyer may prefer, for invoice amount, less freight and 10 per cent. added. Rate of exchange to be taken at $4.80.

7. When more than two separate parcels are required in any one vessel, each and every parcel shall be charged extra per 1000 feet, as follows:

Any number of parcels, none of which are of lesser quantity than 300,000 feet	No charge
Two parcels, one of which is over 300,000 feet, and the other of any quantity under 300,000 feet	No charge
Three parcels or more:—	
Every parcel over 300,000 feet	No charge
Every parcel 201 M to 300 M	20c per M ft. B.M.
Every parcel 101 M to 200 M	40c per M ft. B.M.
Every parcel 100 M and less	80c per M ft. B.M.

8. **Delivery:** Unless otherwise arranged and agreed upon between buyer and seller, delivery will be made to ship at usual safe port (to be named by seller or his agent) within reach of ship's tackles, according to custom, at the average rate of 50 M feet B. M., or its equivalent, per working day. The act of God, arrest and restraint of Governments and people, civil commotions, floods, fire, strikes, lockouts, accidents to mills and, or docks and, or wharves, and any other hindrances beyond the control of seller or his agents, always excepted.

9. Prices in this schedule are based on delivery to sailing vessels. Delivery to steamers subject to special negotiations at time of sale.

10. **Marking:** The cost of marking lumber when required by buyer to be at buyer's expense.

GRADING

NOTES TO INSPECTORS

Sale Measure

All fractions of a foot in length shall be measured as of the contents of one foot.

All lumber sawn less than one inch in thickness shall be measured as of one inch, i. e., surface measure.

All rough lumber, one inch and over in thickness, shall be measured at board measure contents.

All worked or surfaced lumber shall be measured at the board measure contents before working.

Sizes 4 inches and under in thickness and 6 inches and under in width will be worked ⅛-inch less for each side or edge surfaced.

Sizes over 4 inches in thickness and 6 inches and over in width will be worked ¼-inch less for each side or edge surfaced.

In sizes 4 inches and under in thickness and over 6 inches in width each side will be surfaced ⅛-inch less and each edge ¼-inch less.

Tongued and Grooved, surfaced one side, will be worked:

3/16-inch less in thickness;

⅝-inch narrower on face.

In "Kiln Dried" or "Air Dried" stock, bright sap is not to be considered a defect.

All dimensions are sold subject to any natural shrinkage, whether green, partially or wholly seasoned. As it is a well known fact that all lumber does not shrink alike, therefore, where seasoned lumber is shipped, especially so in the grades of Clears and Selects, it will, at the time of loading, be considered by the Supervisor and Inspector whether it will work to the dry standards in its size in accordance with the official chart for worked sizes, included in this list.

RULES

CLEARS

Edge Grain Clears, in widths 10 inches and wider, shall show edge grain on face for at least ½ of width, and otherwise free from defects on one face and two edges.

Other Clears shall be sound lumber well sawn, one side and two edges, free from knots and other defects impairing its use for the probable purpose intended.

Will Allow

In dimensions two inches and less in thickness of contents, 24 inches or less to the linear foot.

Narrow pitch pockets not over 4 inches long, when not extended through the piece and small knots when appearing on one side only.

Small amount of light colored sap when not exceeding ⅛ the width or ¼ the length.

In dimensions 3 to 6 inches thick, 6 to 10 inches wide.

Narrow pitch pockets not over 6 inches long on one side or edge.

Light colored sap not exceeding ¼ face or edge or ½ the length.

Knots not exceeding 1 inch in diameter when on one side and lower half of edges.

In dimensions larger than above.

Pitch pockets when not extending through the piece.

Light colored sap on corners not exceeding 3 inches on face and edge.

Knots 2 inches and less in diameter, according to size of piece, when on one face and ½ of each corresponding edge, leaving one face and upper half of each edge clear.

SELECTS

Shall be sound, strong lumber, well sawn.

Will Allow

In sizes 6x6 and less, knots not to exceed 1 inch in diameter; sap on corners ¼ the width and ¼ the thickness; small pitch pockets when not exceeding 6 inches in length.

In sizes over 6x6, knots not to exceed 2 inches in diameter, varying according to the size of the piece; sap on corner not to exceed 2 inches on both face and edge; pitch pockets not to exceed 6 inches in length.

Defects in all cases to be considered in connection with the size of the piece and its general quality.

MERCHANTABLE

This grade shall consist of sound, strong lumber, free from shakes, large, loose or rotten knots and defects that materially impair its strength; well manufactured and suitable for good substantial constructional purposes.

Will Allow

Slight variations in sawing, sound knots, pitch pockets and sap on corners, 1-3 the width and ½ the thickness or its equivalent. Defects in all cases to be considered in connection with the size of the piece and its general quality. In timber 10x10 inches and over sap shall not be considered a defect. Discoloration through exposure to elements, other than black sap, shall not be deemed a defect excluding lumber from this grade, if otherwise conforming to Merchantable grade.

COMMON

This grade shall consist of lumber having knots, sap and other defects which exclude it from grading as Merchantable, but of a quality suitable for rough kinds of work.

SHIP PLANK

Including Outboard Planking, Garboards, Wales, Clamps, Rails and lumber for similar purposes, shall be close grained lumber, free from large knots or other defects impairing its use for the purposes required.

Will Allow

Sap on edges not exceeding ¼ the face and 1-3 the length.

Sound hard knots not exceeding 1¼ inches in diameter when not on corners or calking portion of edges.

Pitch pockets if narrow and not extending through the piece.

DECK PLANK

Shall be uniformly sawn, close grained and free from knots and defects on one face and calking edges. Flat sizes shall show edge grain on broad face.

Will Allow

Sap on corners of upper side not exceeding ¼ face width or 1-3 length.

Sound hard knots not exceeding 1 inch in diameter on lower side and lower half of calking edge.

FLOORING

Fir Flooring No. 1. Edge Grain, shall be free from all defects and well manufactured. Angle of grain not more than 45 degrees from vertical.

Fir Flooring No. 1. Flat Grain, shall be well manufactured and free from all defects except occasional slight roughness in dressing.

Fir Flooring No. 2. Shall be well manufactured, both edge and flat grain. Will admit of slight roughness in dressing, bright sap one-half of the width of the face. One of the following is also permitted with one of above two defects: three close pitch pockets not to exceed 2 inches in length; three tight smooth knots each not more than ¾ of an inch in diameter. Based on 16-foot lengths.

Fir Flooring No. 3. This grade shall consist of lengths 6 feet and up regardless of grain and conform generally to grade of Merchantable. Imperfect edges shall not be considered a defect in this grade.

CEILING

Fir Ceiling No. 1. Shall conform to the grade of No. 1 Flat Grain Flooring.

STEPPING NO. 1

This grade shall show edge grain on face to extent of not less than ½ of width and be free from defects on face and edges, and shall conform generally to grade of "Clears."

STEPPING NO. 2

This grade shall show edge grain on face to extent of not less than ½ of its width and conform generally to grade of "Selects."

RUSTIC

Rustic No. 1. Shall conform to the grade of No. 1 Flat Grain Flooring.

Rustic No. 2. Shall conform to the grade of No. 2 Flooring.

MINING TIMBER

This grade shall consist of sound lumber free from bad shakes, splits, rot and rotten knots. Will allow slight variations in sawing, modcrate wane and sap.

RAILROAD TIES

Ties must be cut square, free from stain, rot and large shakes and large knots where the rails lie. Will allow moderate wane and slight variations in sawing. Sap allowed.

PICKETS

Pickets 1x3 in.—4 ft.—4 ft. 6 in.—5 ft. Will allow variations in size of ⅛ of an inch in thickness and ⅛ of an inch in

width. Sap, pitch pockets and two sound hard knots not over 1 inch in diameter allowed.

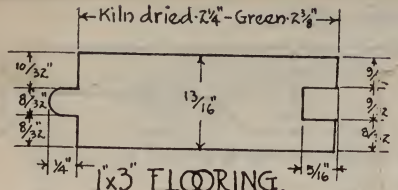
STAVES

No. 1 Staves 1x3 in. x 4 ft. Sawn full size clear. If seasoned will allow ⅛ of an inch scant in width.

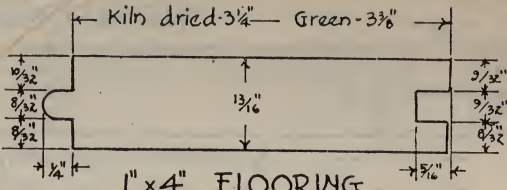
No. 2 Staves 1x3 in. x 4 ft. Will allow variations in size of ⅛ of an inch in thickness and ⅛ of an inch in width. Sap and two sound hard knots not over ¾ of an inch in diameter allowed.

LATH

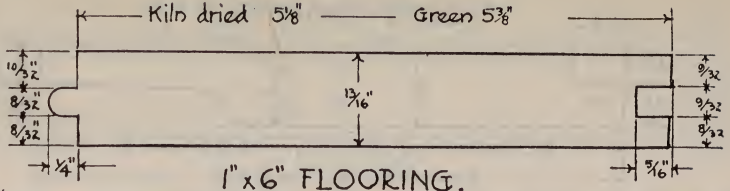
Lath, three thicknesses to one inch. Will allow sap.



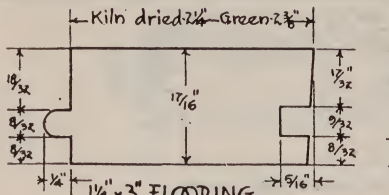
1"x3" FLOORING.



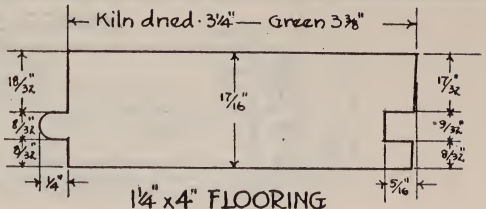
1"x4" FLOORING.



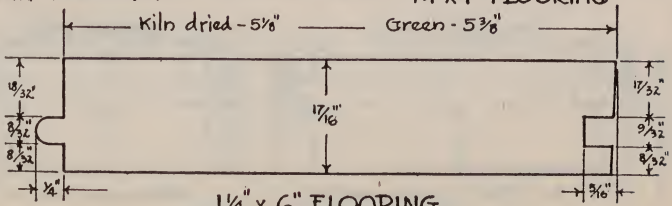
1"x6" FLOORING.



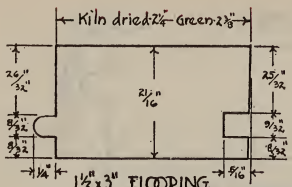
1¼"x3" FLOORING.



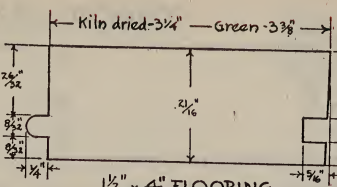
1¼" x4" FLOORING



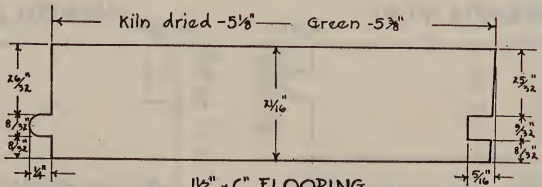
1¼" x 6" FLOORING.



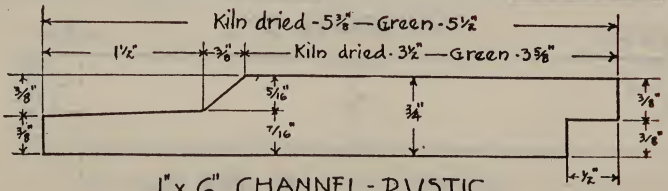
1½"x3" FLOORING



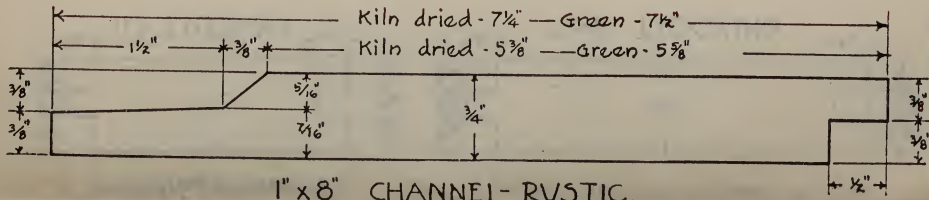
1½" x 4" FLOORING.



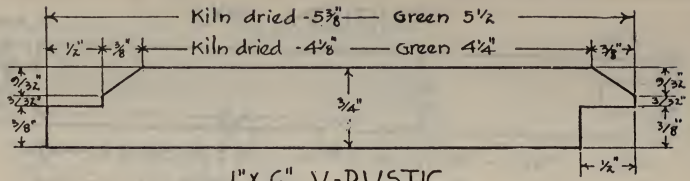
1½" x 6" FLOORING.



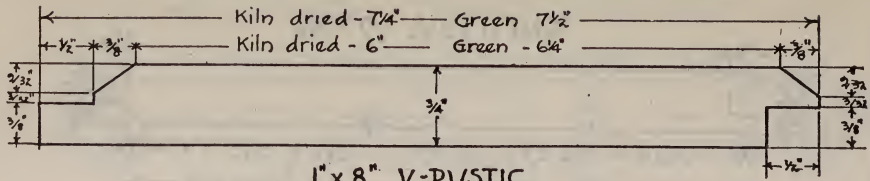
1" x 6" CHANNEL - RUSTIC.



1" x 8" CHANNEL- RUSTIC.



1"X 6" V-RUSTIC



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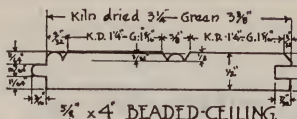

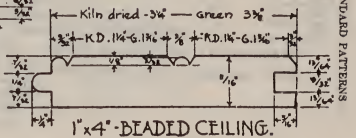

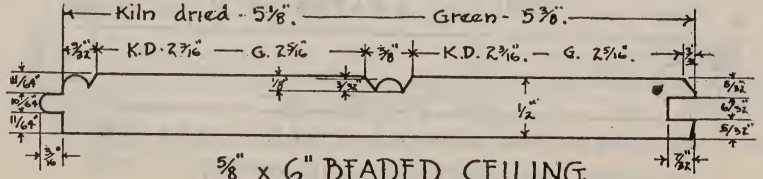

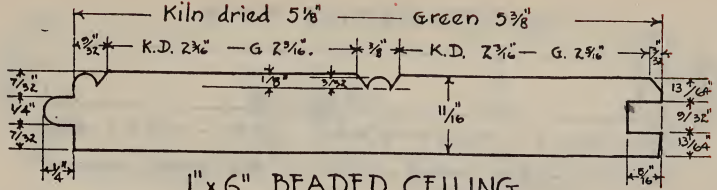

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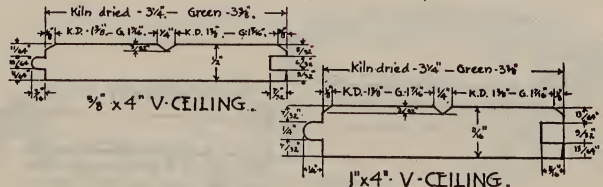
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K.D. - 1⅜" — G. 1⅜". — K.D. 1⅜" — G. 1⅜".
⅝" x 4" V-CEILING.
Kiln dried - 3¼" — Green - 3⅜"
K.D. - 1⅜" — G. 1⅜" — K.D. 1⅜" — G. 1⅜"
¾"
1" x 4" V-CEILING.
STANDARD PATTERNS

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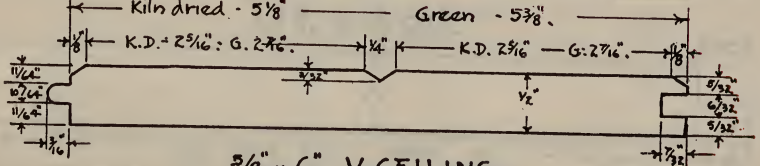

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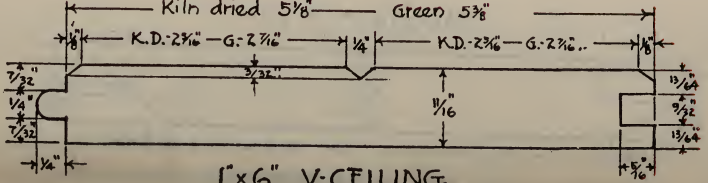

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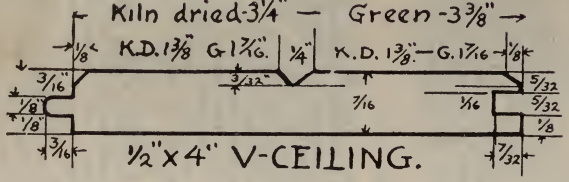
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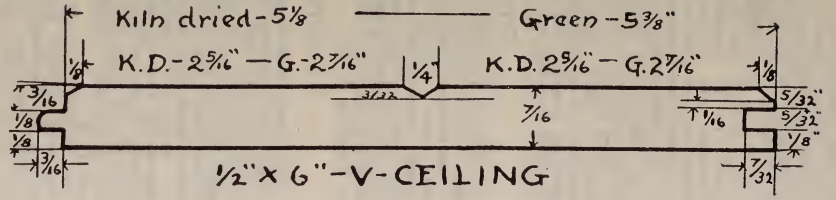
½"x4" V-CEILING.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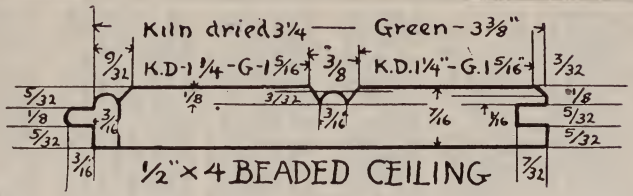
½"x6"-V-CEILING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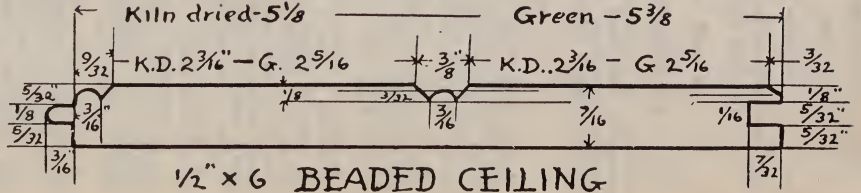
5/32 5/32
3/16 7/32
½"x4 BEADED CEILING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3/16 7/32
½"x6 BEADED CEILING

From Bulletin No. 10

U. S. Dept. of Agriculture

Division of Forestry

LIST OF THE MORE IMPORTANT WOODS OF THE UNITED STATES

(Arranged alphabetically.)

A.—CONIFEROUS WOODS

Woods of simple and uniform structure, generally light, soft but stiff; abundant in suitable dimensions and forming by far the greatest part of all the lumber used.

Cedar

Light, soft, stiff, not strong, of fine texture, sap and heartwood distinct, the former lighter, the latter a dull, grayish brown or red. The wood seasons rapidly, shrinks and checks but little, and is very durable. Used like soft pine, but owing to its great durbility preferred for shingles, etc. Small sizes used for posts, ties, etc. Cedars usually occur scattered, but they form, in certain localities, forests of considerable extent.

a. White cedars.—Heartwood a light grayish brown.

1. White cedar (Thuya occidentalis) (Arborvitae): Scattered along streams and lakes, frequently covering extensive swamps; rarely large enough for lumber, but commonly used for posts, ties, etc. Maine to Minnesota and northward.

2. Canoe cedar (Thuya gigantea) (red cedar of the West): In Oregon and Washington a very large tree, covering extensive swamps; in the mountains much smaller, skirting the water courses an important lumber tree. Washington to northern California and eastward to Montana.

3. White cedar (Chamæcyparis thyoides): Medium-sized tree, wood very light and soft. Along the coast from Maine to Mississippi.

4. White cedar (Chamæcyparis lawsoniana) (Port Orford cedar, Oregon cedar, Lawson's cypress, ginger pine): A very large tree, extensively cut for lumber; heavier and stronger than the preceding. Along the coast line of Oregon.

5. White cedar (Libocedrus decurrens) (incense cedar): A large tree, abundantly scattered among pine and fir; wood fine grained. Cascades and Sierra Nevada of Oregon and California.

b. Red cedars.—Heartwood red.

6. Red cedar (Juniperus virginiana) (Savin juniper): Similar to white cedar, but of somewhat finer texture. Used in cabinetwork in cooperage, for veneers, and especially for lead pencils, for which purpose alone several million feet are cut each year. A small to medium sized tree scattered through the forests, or, in the West, sparsely covering extensive areas (cedar brakes). The red cedar is the most widely distributed conifer of the United States, occurring from the Atlantic to the Pacific and from Florida to Minnesota, but attains a suitable size for lumber only in the Southern, and more especially the Gulf, States.

7. Redwood (Sequoia sempervirens): Wood in its quality and uses like white cedar; the narrow sapwood whitish; the heartwood light red, soon turning to brownish red when exposed. A very large tree, limited to the coast ranges of California, and forming considerable forests, which are rapidly being converted into lumber.

Cypress

8. Cypress (Taxodium distichum) (bald cypress; black, white and red cypress): Wood in appearance, quality, and uses similar to white cedar. "Black cypress" and "white cypress" are heavy and light forms of the same species. The cypress is a large deciduous tree, occupying much of the swamp and overflow land along the coast and rivers of the Southern States.

Fir

This name is frequently applied to wood and to trees which are not fir, most commonly to spruce, but also, especially in English markets, to pine. It resembles spruce, but is easily distinguished from it, as well as from pine and larch, by the absence of resin ducts. Quality, uses, and habits similar to spruce.

9. Balsam fir (Abies balsamea): A medium-sized tree scattered throughout the northern pineries; cut, in lumber operations whenever of sufficient size, and sold with pine or spruce. Minnesota to Maine and northward.

10. White fir (Abies grandis and Abies concolor): Medium to very large sized tree, forming an important part of most of the Western mountain forests, and furnishing much of the lumber of the respective regions. The former occurs from Vancouver to central California and eastward to Montana; the latter from Oregon to Arizona and eastward to Colorado and New Mexico.

11. White fir (Abies amabilis): Good-sized tree, often forming extensive mountain forests. Cascade Mountains of Washington and Oregon.

12. Red fir (Abies nobilis) (not to be confounded with Douglas fir; see No. 37): Large to very large tree, forming with A. amabilis extensive forests on the slope of the mountains between 3,000 and 4,000 feet elevation. Cascade Mountains of Oregon.

13. Red fir (Abies magnifica): Very large tree, forming forests about the base of Mount Shasta. Sierra Nevada of California, from Mount Shasta southward.

Hemlock

Light to medium weight, soft, stiff but brittle, commonly crossgrained, rough and splintery; sapwood and heartwood not well defined; the wood of a light, reddish-gray color, free from resin ducts, moderately durable, shrinks and warps considerably, wears rough, retains nails firmly. Used principally for dimension stuff and timbers. Hemlocks are medium to large sized trees, commonly scattered among broad-leaved trees and conifers, but often forming forests of almost pure growth.

14. Hemlock (Tsuga canadensis): Medium-sized tree, furnishes almost all the hemlock of the Eastern market. Maine to Wisconsin; also following the Alleghanies southward to Georgia and Alabama.

15. Hemlock (Tsuga mertensiana): Large-sized tree, wood claimed to be heavier and harder than the Eastern form and of superior quality. Washington to California and eastward to Montana.

Larch or Tamarack

Wood like the best of hard pine, both in appearance, quality, and uses, and owing to its great durability, somewhat preferred in shipbuilding, for telegraph poles, and railroad ties. In its structure it resembles spruce. The larches are deciduous trees, occasionally covering considerable areas, but usually scattered among other conifers.

16. Tamarack (Larix americana) (Hackmatack): Medium-sized tree, often covering swamps, in which case it is smaller and of poor quality. Maine to Minnesota, and southward to Pennsylvania.

17. Tamarack (L. occidentalis): Large-sized trees, scattered, locally abundant. Washington and Oregon to Montana.

Pine

Very variable, very light and soft in "soft" pine, such as white pine; of medium weight to heavy and quite hard in "hard" pine, of which longleaf or Georgia pine is the extreme form. Usually it is stiff, quite strong, of even texture, and more or less resinous. The sapwood is yellowish white; the heartwood, orange brown. Pine shrinks moderately, seasons rapidly and without much injury; it works easily; is never too hard to nail (unlike oak or hickory); it is mostly quite durable, and if well seasoned is not subject to the attacks of boring insects. The heavier the wood, the darker, stronger and harder it is, and the more it shrinks and checks. Pine is used more extensively than any other kind of wood. It is the principal wood in common carpentry, as well as in all heavy construction, bridges, trestles, etc. It is also used in almost every other wood industry, for spars, masts, planks, and timbers in shipbuilding, in car and wagon construction, in cooperage, for crates and boxes, in furniture work, for toys and patterns, railway ties, water pipes, excelsior, etc. Pines are usually large trees with few branches, the straight, cylindrical, useful stem forming by far the greatest part of the tree; they occur gregariously, forming vast forests, a fact which greatly facilitates their exploitation. Of the many special terms applied to pine as lumber, denoting sometimes differences in quality, the following deserve attention:

"White pine," "pumpkin pine," "soft pine," in the Eastern markets refer to the wood of the white pine (Pinus strobus), and on the Pacific Coast to that of the sugar pine (Pinus lambertiana).

"Yellow pine" is applied in the trade to all the Southern lumber pines; in the Northeast it is also applied to the pitch pine (P. rigida); in the West it refers mostly to bull pine (P. ponderosa).

"Yellow longleaf pine," "Georgia pine," chiefly used in advertisement, refers to longleaf pine (P. palustris).

"Hard pine" is a common term in carpentry, and applies to everything except white pine.

"Pitch pine" includes all Southern pines and also the true pitch pine (P. rigida), but is mostly applied, especially in foreign markets, to the wood of the longleaf pine (P. palustris).

For the great variety of confusing local names applied to the Southern pines in their homes, part of which have been adopted in the markets of the Atlantic seaboard, see report of Chief of Division of Forestry for 1891, page 212, etc., and also the list below.

a. Soft pines.

18. White pine (Pinus strobus): Large to very large sized tree; for the last fifty years the most important timber tree of the Union, furnishing the best quality of soft pine. Minnesota, Wisconsin, Michigan, New England, along the Alleghanies to Georgia.

19. Sugar pine (Pinus lambertiana): A very large tree, together with Abies con-

color, forming extensive forests; important lumber tree. Oregon and California.

20. White pine (Pinus monticola): A large tree, at home in Montana, Idaho, and the Pacific States; most common and locally used in northern Idaho.

21. White pine (Pinus flexilis): A small tree, forming mountain forests of considerable extent and locally used; Eastern Rocky Mountain slopes; Montana to New Mexico.

b. Hard pines.

22. Longleaf pine (Pinus palustris) (Georgia pine, yellow pine, long straw pine, etc.): Large tree forms extensive forests and furnishes the hardest and strongest pine lumber in the market. Coast region from North Carolina to Texas.

23. Bull pine (Pinus ponderosa) (yellow pine): Medium to very large sized tree, forming extensive forests in Pacific and Rocky Mountain regions; furnishes most of the hard pine of the West; sapwood wide; wood very variable.

24. Loblolly pine (Pinus taeda) (slash pine, old field pine, rosemary pine, sap pine, short straw pine, etc.): Large-sized tree, forms extensive forests; wider-ringed, coarser, lighter, softer, with more sapwood than the longleaf pine, but the two often confounded. This is the common lumber pine from Virginia to South Carolina, and is found extensively in Arkansas and Texas. Southern States: Virginia to Texas and Arkansas.

25. Norway pine (Pinus resinosa): Large-sized tree, never forming forests, usually scattered or in small groves, together with white pine; largely sapwood and hence not durable. Minnesota to Michigan; also in New England to Pennsylvania.

26. Shortleaf pine (Pinus echinata) (slash pine, Carolina pine, yellow pine, old field pine, etc.): Resembles loblolly pine; often approaches in its wood the Norway pine. The common lumber pine of Missouri and Arkansas. North Carolina to Texas and Missouri.

27. Cuban pine (Pinus cubensis) (slash pine, swamp pine, bastard pine, meadow pine): Resembles longleaf pine, but commonly has wider sapwood and coarser grain; does not enter the markets to any great extent. Along the coast from South Carolina to Louisiana.

28. Bull pine (Pinus jeffreyi) (black pine): Large-sized tree, wood resembling bull pine (P. ponderosa); used locally in California, replacing P. ponderosa at high altitudes.

The following are small to medium sized pines, not commonly offered as lumber in the market; used locally for timber, ties, etc.:

29. Black pine (Pinus murrayana) (lodgepole pine, tamarack): Rocky Mountains and Pacific regions.

30. Pitch pine (Pinus rigida): Along the coast from New York to Georgia and along the mountains to Kentucky.

31. Jersey Pine (Pinus inops) (scrub pine): As before.

32. Gray Pine (Pinus banksiana) scrub pine): Maine, Vermont, and Michigan to Minnesota.

Redwood. (See Cedar).

Spruce

Resembles soft pine, is light, very soft, stiff, moderately strong, less resinous than pine; has no distinct heartwood, and is of whitish color. Used like soft pine, but also employed as resonance wood and preferred for paper pulp. Spruces, like pines, form extensive forests; they are more frugal, thrive on thinner soils, and bear more shape, but usually require a more humid climate. "Black" and "white spruce," as applied by lumbermen, usually refer to narrow and wide ringed forms of the black spruce (Picea nigra).

33. Black spruce (Picea nigra): Medium-sized tree, forms extensive forests in northeastern United States and in British America; occurs scattered or in groves, especially in low lands throughout the Northern pineries. Important lumber tree in Eastern United States. Maine to Minnesota, British America, and on the Alleghanies to North Carolina.

34. White spruce (Picea alba): Generally associated with the preceding; most abundant along streams and lakes, grows largest in Montana and forms the most important tree of the subarctic forest of British America. Northern United States, from Maine to Minnesota, also from Montana to Pacific, British America.

35. White spruce (Picea engelmanni): Medium to large sized tree, forming extensive forests at elevations from 5,000 to 10,000 feet above sea level; resembles the preceding, but occupies a different station. A very important timber tree in the central and southern parts of the Rocky Mountains. Rocky Mountains from Mexico to Montana.

36. Tide-land spruce (Picea sitchensis): A large-sized tree, forming an extensive coast-belt forest. Along the seacoast from Alaska to Central California.

Bastard Spruce

Spruce or fir in name but resembling hard pine or larch in the appearance, quality, and uses of its wood.

37. Douglas spruce (Pseudotsuga douglasii) (yellow fir, red fir, Oregon pine): One

of the most important trees of the Western United States; grows very large in the Pacific States, to fair size in all parts of the mountains, in Colorado up to about 10,000 feet above sea level; forms extensive forests, often of pure growth. Wood very variable, usually coarse-grained and heavy, with very pronounced summer wood, hard and strong ("red" fir), but often fine-grained and light ("yellow" fir). It replaces hard pine and is especially suited to heavy construction. From the plains to the Pacific Ocean; from Mexico to British America.

Tamarack. (See Larch.)

Yew

Wood heavy, hard, extremely stiff and strong, of fine texture with a pale yellow sapwood, and an orange red heart; seasons well and is quite durable. Yew is extensively used for archery, bows, turner's ware, etc. The Yew form no forests, but occur scattered with other conifers.

38. Yew (Taxus brevifolia): A small to medium sized tree of the Pacific region.

B. — BROAD-LEAVED WOODS (HARDWOODS)

Woods of complex and very variable structure and therefore differing widely in quality, behavior, and consequently in applicability to the arts.

Ash

Wood heavy, hard, strong, stiff, quite tough, not durable in contact with soil, straight grained, rough on the split surface and coarse in texture. The wood shrinks moderately, seasons with little injury, stands well and takes a good polish. In carpentry ash is used for finishing lumber, stairways, panels, etc.; it is used in shipbuilding, in the construction of cars, wagons, carriages, etc., in the manufacture of farm implements, machinery, and specially of furniture of all kinds, and also for harness work; for barrels, baskets, oars, tool handles, hoops, clothespins, and toys. The trees of the several species of ash are rapid growers, of small to medium height with stout trunks; they form no forests, but occur scattered in almost all our broad-leaved forests.

39. White ash (Fraxinus americana): Medium, sometimes large sized tree. Basin of the Ohio, but found from Maine to Minnesota and Texas.

40. Red ash (Fraxinus pubescens); Small-sized tree. North Atlantic States, but extends to the Mississippi.

41. Black ash (Fraxinus sambucifolia) (hoop ash, ground ash): Medium-sized tree, very common. Maine to Minnesota, and southward to Virginia and Arkansas.

42. Blue ash (Fraxinus quadrangulata): Small to medium sized. Indiana and Illinois; occurs from Michigan to Minnesota and southward to Alabama.

43. Green ash (Fraxinus viridis): Small-sized tree. New York to the Rocky Mountains, and southward to Florida and Arizona.

44. Oregon ash (Fraxinus oregana): Medium-sized tree. Western Washington to California.

Aspen. (See Poplar.)

Basswood

45. Basswood (Tilia americana) (lime tree, American linden, lin, bee tree): Wood light, soft, stiff but not strong, of fine texture, and white to light brown color. The wood shrinks considerably in drying, works and stands well; it is used in carpentry, in the manufacture of furniture and woodenware, both turned and carved, in cooperage, for toys, also for paneling of car and carriage bodies. Medium to large sized tree, common in all Northern broad-leaved forests; found throughout the Eastern United States.

46. White basswood (Tilia heterophylla): A small-sized tree most abundant in the Alleghany region.

Beech

47. Beech (Fagus ferruginea): Wood heavy, hard, stiff, strong, of rather coarse texture, white to light brown, not durable in the ground, and subject to the inroads of boring insects; it shrinks and checks considerably in drying, works and stands well and takes a good polish. Used for furniture, in turnery, for handles, lasts, etc. Abroad it is very extensively employed by the carpenter, millwright, and wagon maker, in turnery as well as wood carving. The beech is a medium-sized tree, common, sometimes forming forest; most abundant in the Ohio and Mississippi basin, but found from Maine to Wisconsin and southward to Florida.

Birch

Wood heavy, hard, strong, of fine texture; sapwood whitish, heartwood in shades of brown with red and yellow; very handsome, with satiny luster, equaling cherry. The wood shrinks considerably in drying, works and stands well and takes a good polish, but is not durable, if exposed. Birch is used for finishing lumber in building, in the manufac-

ture of furniture, in wood turnery for spools, boxes, wooden shoes, etc., for shoe lasts and pegs, for wagon hubs, ox yokes, etc., also in wood carving. The birches are medium-sized trees, form extensive forests northward and occur in all broad-leaved forests of the Eastern United States.

48. Cherry birch (Betula lenta) (black birch, sweet birch, mahogany birch): Medium-sized tree; very common. Maine to Michigan and to Tennessee.

49. Yellow birch (Betula lutea) (gray birch): Medium-sized tree; common, Maine to Minnesota and southward to Tennessee.

50. Red birch (Betula nigra) (river birch): Small to medium sized tree; very common; lighter and less valuable than the preceding. New England to Texas and Missouri.

51. Canoe birch (Betula papyrifera) (white birch, paper birch): Generally a small tree; common, forming forests; wood of good quality but lighter. All along the northern boundary of United States and northward, from the Atlantic to the Pacific.

Black Walnut. (See Walnut.)

Blue Beech

52. Blue beech (Carpinus caroliniana) (hornbeam, water beech, ironwood): Wood very heavy, hard, strong, stiff, of rather fine texture and white color; not durable in the ground; shrinks and checks greatly, but works and stands well. Used chiefly in turnery for tool handles, etc. Abroad, much used by mill and wheel wrights. A small tree, largest in the Southwest, but found in nearly all parts of the Eastern United States.

Bois D'Arc. (See Osage Orange.)

Buckeye—Horse Chestnut

Wood light, soft, not strong, often quite tough, of fine and uniform texture and creamy white color. It shrinks considerably, but works and stands well. Used for wooden ware, artificial limbs, paper pulp, and locally also for building lumber. Small-sized tree, scattered.

53. Ohio buckeye (Aesculus glabra) (fetid buckeye): Alleghanies, Pennsylvania to Indian Territory.

54. Sweet buckeye (Aesculus flava): Alleghanies, Pennsylvania to Texas.

Butternut

55. Butternut (Juglans cinerea) (white walnut): Wood very similar to black walnut, but light, quite soft, not strong and of light brown color. Used chiefly for finishing lumber, cabinetwork, and cooperage. Medium-sized tree, largest and most common in the Ohio basin; Maine to Minnesota and southward to Georgia and Alabama.

Catalpa

56. Catalpa (Catalpa speciosa): Wood light, soft, not strong, brittle, durable, of coarse texture and brown color; used for ties and posts, but well suited for a great variety of uses. Medium-sized tree; lower basin of the Ohio River, locally common. Extensively planted, and therefore promising to become of some importance.

Cherry

57. Cherry (Prunus serotina): Wood heavy, hard, strong, of fine texture; sapwood yellowish white, heartwood reddish to brown. The wood shrinks considerably in drying, works and stands well, takes a good polish, and is much esteemed for its beauty. Cherry is chiefly used as a decorative finishing lumber for buildings, cars, and boats, also for furniture and in turnery. It is becoming too costly for many purposes for which it is naturally well suited. The lumber-furnishing cherry of this country, the wild black cherry (Prunus scrotina), is a small to medium sized tree, scattered through many of the broad-leaved woods of the western slope of the Alleghanies, but found from Michigan to Florida and west to Texas. Other species of this genus as well as the hawthorns (Crataegus) and wild apple (Pyrus) are not commonly offered in the market. Their wood is of the same character as cherry, often even finer, but in small dimensions.

Chestnut

58. Chestnut (Catanea vulgaris var. americana): Wood light, moderately soft, stiff, not strong, of coarse texture; the sapwood light, the heartwood darker brown. It shrinks and checks considerably in drying, works easily, stands well, and is very durable. Used in cabinetwork, cooperage, for railway ties, telegraph poles, and locally in heavy construction. Medium-sized tree, very common in the Alleghanies, occurs from Maine to Michigan and southward to Alabama.

59. Chinquapin (Castanea pumila): A small-sized tree, with wood slightly heavier but otherwise similar to the preceding; most common in Arkansas, but with nearly the same range as the chestnut.

60. Chinquapin (Castanopsis chrysophylla): A medium-sized tree of the western ranges of California and Oregon.

Coffee Tree

61. Coffee tree (Gymnocladus canadensis) (coffee nut): Wood heavy, hard, strong, very stiff, of coarse texture, durable; the sapwood yellow, the heartwood reddish brown; shrinks and checks considerably in drying; works and stands well and takes a good polish. It is used to a limited extent in cabinetwork. A medium to large sized tree; not common. Pennsylvania to Minnesota and Arkansas.

Cottonwood. (See Poplar.)

Cucumber Tree. (See Tulip.)

Elm

Wood heavy, hard, strong, very tough; moderately durable in contact with the soil; commonly crossgrained, difficult to split and shape, warps, and checks considerably in drying, but stands well if properly handled. The broad sapwood whitish, heart brown, both with shades of gray and red; on split surface rough; texture coarse to fine; capable of high polish. Elm is used in the construction of cars, wagons, etc., in boat and ship building, for agricultural implements and machinery; in rough cooperage, saddlery and harness work, but particularly in the manufacture of all kinds of furniture, where the beautiful figures, especially those of the tangential or bastard section, are just beginning to be duly appreciated. The elms are medium to large sized trees, of fairly rapid growth, with stout trunk, form no forests of pure growth, but are found scattered in all the broad-leaved woods of our country, sometimes forming a considerable portion of the arborescent growth.

62. White elm (Ulmus americana) (American elm, water elm): Medium to large sized tree, common. Maine to Minnesota, southward to Florida and Texas.

63. Rock elm (Ulmus racemosa) (cork elm, hickory elm, white elm, cliff elm): Medium to large sized tree. Michigan, Ohio, from Vermont to Lowa, southward to Kentucky.

64. Red elm (Ulmus fulva) (slippery elm, moose elm): Small-sized tree, found chiefly along water courses. New York to Minnesota, and southward to Florida and Texas.

65. Cedar elm (Ulmus crassifolia): Small-sized tree, quite common. Arkansas and Texas.

66. Winged elm (Ulmus alata) (Wahoo): Small-sized tree, locally quite common. Arkansas, Missouri, and eastern Virginia.

Gum

This general term refers to two kinds of wood usually distinguished as sweet or red gum, and sour, black, or tupelo gum, the former being a relative of the witch-hazel, the latter belonging to the dogwood family.

67. Tupelo (Nyssa sylvatica) (sour gum, black gum): Maine to Michigan, and southward to Florida and Texas. Wood heavy, hard, strong, tough, of fine texture, frequently crossgrained, of yellowish or grayish white color, hard to split and work, troublesome in seasoning, warps and checks considerably, and is not durable if exposed; used for wagon hubs, wooden ware, handles, wooden shoes, etc. Medium to large sized trees, with straight, clear trunks; locally quite abundant, but never forming forests of pure growth.

68. Tupelo gum (Nyssa uniflora) (cotton gum): Lower Mississippi basin, northward to Illinois and eastward to Virginia, otherwise like preceding species.

69. Sweet gum (Liquidambar styraciflua) (red gum, liquidambar, bilsted): Wood rather heavy, rather soft, quite stiff and strong, tough, commonly crossgrained, of fine texture; the broad sapwood whitish, the heartwood reddish brown; the wood shrinks and warps considerably, but does not check badly, stands well when fully seasoned, and takes good polish. Sweet gum is used in carpentry, in the manufacture of furniture, for cut veneer, for wooden plates, plaques, baskets, etc., also for wagon hubs, hat blocks, etc. A large-sized tree, very abundant, often the principal tree in the swampy parts of the bottoms of the Lower Mississippi Valley; occurs from New York to Texas and from Indiana to Florida.

Hackberry

70. Hackberry (Celtis occidentalis) (sugar berry): The handsome wood heavy, hard, strong, quite tough, of moderately fine texture, and greenish or yellowish white color; shrinks moderately, works well, and takes a good polish. So far but little used in the manufacture of furniture. Medium to large sized tree, locally quite common, largest in the Lower Mississippi Valley; occurs in nearly all parts of the Eastern United States.

Hickory

Wood very heavy, hard, and strong, proverbially tough, of rather coarse texture, smooth and of straight grain. The broad sapwood white, the heart reddish nut brown. It dries slowly, shrinks and checks considerably; is not durable in the ground, or if exposed, and, especially the sapwood, is always subject to the inroads of boring insects. Hickory excels as carriage and wagon stock, but is also extensively used in the manufacture of implements and machinery, for tool handles, timber pins, for harness work, and cooperage. The hickories are tall trees with

slender stems, never form forests, occasionally small groves, but usually occur scattered among other broad-leaved trees in suitable localities. The following species all contribute more or less to the hickory of the markets:

71. Shagbark hickory (Hicoria ovata) (shellback hickory): A medium to large sized tree, quite common; the favorite among hickories; best developed in the Ohio and Mississippi basins; from Lake Ontario to Texas, Minnesota to Florida.

72. Mockernut hickory (Hicoria alba) (black hickory, bull and black nut, big bud, and white-heart hickory): A medium to large sized tree, with the same range as the foregoing; common, especially in the South.

73. Pignut hickory (Hicoria glabra) (brown hickory, black hickory, switch-bud hickory): Medium to large sized tree, abundant; all Eastern United States.

74. Bitter nut hickory (Hicoria minima) (swamp hickory): A medium-sized tree, favoring wet localities, with the same range as the preceding.

75. Pecan (Hicoria pecan) (Illinois nut): A large tree, very common in the fertile bottoms of the Western streams. Indiana to Nebraska and southward to Louisiana and Texas.

Holly

76. Holly (Ilex opaca): Wood of medium weight, hard, strong, tough, of fine texture and white color; works and stands well, used for cabinetwork and turnery. A small tree, most abundant in the Lower Mississippi Valley and Gulf States, but occurring eastward to Massachusetts and north to Indiana.

Horse-Chestnut. (See Buckeye.)

Ironwood. (See Blue beech.)

Locust

This name applies to both of the following:

77. Black locust (Robinia pseudacacia) (black locust, yellow locust): Wood very heavy, hard, strong, and tough, of coarse texture, very durable in contact with the soil, shrinks considerably and suffers in seasoning; the very narrow sapwood yellowish, the heartwood brown, with shades of red and green. Used for wagon hubs, tree nails or pins, but especially for ties, posts, etc. Abroad it is much used for furniture and farm implements and also in turnery. Small to medium sized tree, at home in the Alleghanies, extensively planted, especially in the West.

78. Honey locust (Gleditschia triacanthos) (black locust, sweet locust, three-thorned acacia): Wood heavy, hard, strong, tough, of coarse texture, susceptible of a good polish, the narrow sapwood yellow, the heartwood brownish red. So far, but little appreciated except for fencing and fuel; used to some extent for wagon hubs and in rough construction. A medium-sized tree, found from Pennsylvania to Nebraska, and southward to Florida and Texas; locally quite abundant.

Magnolia. (See Tulip.)

Maple

Wood heavy, hard, strong, stiff, and tough, of fine texture, frequently wavy-grained, this giving rise to "curly" and "blister" figures; not durable in the ground or otherwise exposed. Maple is creamy white, with shades of light brown in the heart; shrinks moderately, seasons, works and stands well, wears smoothly, and takes a fine polish. The wood is used for ceiling, flooring, paneling, stairway, and other finishing lumber in house, ship, and car construction; it is used for the keels of boats and ships, in the manufacture of implements and machinery, but especially for furniture, where entire chamber sets of maple rival those of oak. Maple is also used for shoe lasts and other form blocks, for shoe pegs, for piano actions, school apparatus, for wood type in show bill printing, tool handles, in wood carving, turnery, and scroll work. The maples are medium-sized trees, of fairly rapid growth; sometimes form forests and frequently constitute a large proportion of the arborescent growth.

79. Sugar maple (Acer saccharum) (hard maple, rock maple): Medium to large sized tree, very common, forms considerable forests. Maine to Minnesota, abundant, with birch, in parts of the pineries; southward to northern Florida; most abundant in the region of the Great Lakes.

80. Red maple (Acer rubrum) (swamp or water maple): Medium-sized tree. Like the preceding, but scattered along water courses and other moist localities.

81. Silver maple (Acer saccharinum) (soft maple, silver maple): Medium-sized, common; wood lighter, softer, inferior to hard maple, and usually offered in small quantities and held separate in the market. Valley of the Ohio, but occurs from Maine to Dakota and southward to Florida.

82. Broad-leafed maple (Acer macrophyllum): Medium-sized tree, forms considerable forests, and like the preceding has a lighter, softer, and less valuable wood. Pacific Coast.

Mulberry

83. Red mulberry (Morbus rubra): Wood moderately heavy, hard, strong, rather tough, of coarse texture, durable; sapwood whitish,

heart yellow to orange brown; shrinks and checks considerably in drying; works and stands well. Used in cooperage and locally in shipbuilding and in the manufacture of farm implements. A small-sized tree, common in the Ohio and Mississippi valleys, but widely distributed in the Eastern United States.

Oak

Wood very variable, usually very heavy and hard, very strong and tough, porous, and of coarse texture; the sapwood whitish, the heart "oak" brown to reddish brown. It shrinks and checks badly, giving trouble in seasoning, but stands well, is durable, and little subject to attacks of insects. Oak is used for many purposes; in ship-building for heavy construction, in common carpentry, in furniture, car, and wagon work, cooperage, turnery, and even in wood carving; also in the manufacture of all kinds of farm implements, wooden mill machinery, for piles and wharves, railway ties, etc. The oaks are medium to large sized trees, forming the predominating part of a large portion of our broad-leaved forests, so that these are generally "oak forests" though they always contain a considerable proportion of other kinds of trees. Three well-marked kinds, white, red, and live oak, are distinguished and kept separate in the market. Of the two principal kinds white oak is the stronger, tougher, less porous, and more durable. Red oak is usually of coarser texture, more porous, often brittle, less durable, and even more troublesome in seasoning than white oak. In carpentry and furniture work, red oak brings about the same price at present as white oak. The red oaks everywhere accompany the white oaks, and like the latter are usually represented by several species in any given locality. Live oak, once largely employed in shipbuilding, possesses all the good qualities (except that of size) of white oak, even to a greater degree. It is one of the heaviest, hardest, and most durable building timbers of this country; in structure it resembles the red oaks, but is much less porous.

84. White oak (Quercus alba): Medium to large sized tree, common in the Eastern States, Ohio and Mississippi valleys; occurs throughout Eastern United States.

85. Bur oak (Quercus macrocarpa) (mossy-cup oak, over-cup oak): Large-sized tree, locally abundant, common. Bottoms west of Mississippi; range farther west than preceding.

86. Swamp white oak (Quercus bicolor): Large-sized tree, common. Most abundant in the Lake States, but with range as in white oak.

87. Yellow oak (Quercus prinoides) (chestnut oak, chinquapin oak): Medium-sized tree. Southern Alleghanies, eastward to Massachusetts.

88. Basket oak (Quercus michauxii) (cow oak): Large-sized tree, locally abundant; lower Mississippi and eastward to Delaware.

89. Over-cup oak (Quercus Iyrata) (swamp white oak, swamp post oak): Medium to large sized tree, rather restricted; ranges as in the preceding.

90. Post oak (Quercus obtusiloba) (iron oak): Medium to large sized tree. Arkansas to Texas, eastward to New England and northward to Michigan.

91. White oak (Quercus durandii): Medium to large sized tree. Washington to Alabama.

92. White oak (Quercus garryana): Medium to large sized tree. Washington to California.

93. White oak (Quercus lobata): Medium to large-sized tree; largest oak on the Pacific Coast; California.

94. Red oak (Quercus rubra) (black oak): Medium to large-sized tree; common in all parts of its range. Maine to Minnesota, and southward to the Gulf.

95. Black oak (Quercus tinctoria), (yellow oak): Medium to large-sized tree; very common in the Southern States, but occurring north as far as Minnesota, and eastward to Maine.

96. Spanish oak (Quercus falcata), (red oak): Medium-sized tree, common in the South Atlantic and Gulf region, but found from Texas to New York and north to Missouri and Kentucky.

97. Scarlet oak (Quercus coccinea): Medium to large-sized tree; best developed in the lower basin of the Ohio, but found from Maine to Missouri, and from Minnesota to Florida.

98. Pin oak (Quercus palustris) (swamp spanish oak, water oak): Medium to large-sized tree, common along borders of streams and swamps. Arkansas to Wisconsin, and eastward to the Alleghanies.

99. Willow oak (Quercus phellos) (peach oak): Small to medium sized tree. New York to Texas, and northward to Kentucky.

100. Water oak (Quercus aquatica) (duck oak, possum oak, punk oak): Medium to large sized tree, of extremely rapid growth. Eastern Gulf States, eastward to Delaware, and northward to Missouri and Kentucky.

101. Live oak (Quercus virens): Small-sized tree, scattered along the coast from Virginia to Texas.

102. Live oak (Quercus chrysolepis) (maul oak, Valparaiso oak): Medium-sized tree; California.

Osage Orange

103. Osage orange (Maclura aurantiaca) (Bois d'Arc): Wood very heavy, exceedingly hard, strong, not tough, of moderately coarse texture, and very durable; sapwood yellow, heart brown on the end, yellow on longitudinal faces, soon turning grayish brown if exposed; it shrinks considerably in drying, but once dry it stands unusually well. Formerly much used for wheel stock in the dry regions of Texas; otherwise employed for posts, railway ties, etc. Seems too little appreciated; it is well suited for turned ware and especially for wood carving. A small-sized tree, of fairly rapid growth, scattered through the rich bottoms of Arkansas and Texas.

Persimmon

104. Persimmon (Diospyros virginiana): Wood very heavy and hard, strong and tough; resembles hickory, but is of finer texture; the broad sapwood cream color, the heart black; used in turnery for shuttles, plane stocks, shoe lasts, etc. Small to medium sized tree, common and best developed in the Lower Ohio Valley, but occurs from New York to Texas and Missouri.

Poplar and Cottonwood

(See also Tulip wood).—Wood light, very soft, not strong, of fine texture and whitish, grayish to yellowish color, usually with a satiny luster. The wood shrinks moderately (some crossgrained forms warp excessively), but checks little; is easily worked, but is not durable. Used as building and furniture lumber, in cooperage for sugar and flour barrels, for crates and boxes (especially cracker boxes), for wooden ware and paper pulp.

105. Cottonwood (Populus monilifera): Large-sized tree; forms considerable forests along many of the Western streams, and furnishes most of the cottonwood of the market. Mississippi Valley and west; New England to the Rocky Mountains.

106. Balsam (Populus balsamifera) (balm of Gilead): Medium to large sized tree; common all along the northern boundary of the United States.

107. Black cottonwood (Populus trichocarpa): The largest deciduous tree of Washington; very common. Northern Rocky Mountains and Pacific region.

108. Cottonwood (Populus fremontii var. wislizeni): Medium to large sized tree, common, Texas to California.

109. Poplar (Populus grandidentata): Medium-sized tree, chiefly used for pulp, Maine to Minnesota and southward along the Alleghanies.

110. Aspen (Populus tremuloides): Small to medium-sized tree, often forming extensive forests and covering burned areas. Maine to Washington and northward, south in the Western mountains to California and New Mexico.

Sour Gum. (See Gum.)

Red Gum. (See Gum.)

Sassafras

111. Sassafras (Sassafras sassafras): Wood light, soft, not strong, brittle, of coarse texture, durable; sapwood yellow, heart orange brown. Used in cooperage, for skiffs, fencing, etc. Medium-sized tree, largest in the Lower Missisippi Valley, from New England to Texas and from Michigan to Florida.

Sweet Gum. (See Gum.)

Sycamore.

112. Sycamore (Platanus occidentalis) (button wood, button-ball tree, water beech): Wood moderately heavy, quite hard, stiff, strong, tough, usually crossgrained, of coarse texture, and white to light brown color; the wood is hard to split and work, shrinks moderately, warps and checks considerably, but stands well. It is used extensively for drawers, backs, bottoms, etc., in cabinetwork, for tobacco boxes, in cooperage, and also for finishing lumber, where it has too long been underrated. A large tree, of rapid growth, common and largest in the Ohio and Mississippi valleys, at home in nearly all parts of the Eastern United States. The California species—

113. Platanus racemosa resembles in its wood the Eastern form.

Tulip Wood

114. Tulip tree (Liriodendron tulipifera) (yellow poplar, white wood): Wood quite variable in weight, usually light, soft, stiff but not strong, of fine texture, and yellowish color; the wood shrinks considerably, but seasons without much injury; works and stands remarkably well. Used for siding, for paneling and finishing lumber in house, car, and ship building, for side-boards and panels of wagons and carriages; also in the manufacture of furniture, implements and machinery, for pump logs, and almost every kind of common wooden ware, boxes, shelving, drawers, etc. An ideal wood for the carver and

toy man. A large tree, does not form forests, but is quite common, especially in the Ohio Basin; occurs from New England to Missouri and southward to Florida.

115. Cucumber tree (Magnolia acuminata): A medium-sized tree, most common in the Southern Alleghanies, but distributed from New York to Arkansas, southward to Alabama and northward to Illinois. Resembling, and probably confounded with, tulip wood in the markets.

Tupelo. (See Gum.)

Walnut.

116. Black walnut (Juglans nigra): Wood heavy, hard, strong, of coarse texture; the narrow sapwood whitish, the heartwood chocolate brown. The wood shrinks moderately in drying, works and stands well, takes a good polish, is quite handsome, and has been for a long time the favorite cabinet wood in this country. Walnut, formerly used even for fencing, has become too costly for ordinary uses, and is to-day employed largely as a veneer, for inside finish and cabinetwork; also in turnery, for gunstocks, etc. Black walnut is a large tree, with stout trunk, of rapid growth, and was formerly quite abundant throughout the Alleghany region, occurring from New England to Texas, and from Michigan to Florida.

White Walnut. (See Butternut.)

White Wood. (See Tulip, and also Basswood.)

Yellow Poplar. (See Tulip.)

UNITED STATES GOVERNMENT SPECIFICATION FOR PORTLAND CEMENT

From Circular of the Bureau of Standards No. 33

SPECIFICATION

Definition

1. The cement shall be the product obtained by finely pulverizing clinker produced by calcining to incipient fusion an intimate mixture of properly proportioned argillaceous and calcareous substances, with only such additions subsequent to calcining as may be necessary to control certain properties. Such addition shall not exceed 3 per cent., by weight, of the calcined product.

Composition

2. In the finished cement, the following limits shall not be exceeded:

	Per cent.
Loss on ignition for 15 minutes	4
Insoluble residue	1
Sulphuric anhydride (SO_3)	1.75
Magnesia (MgO)	4

Specific Gravity

3. The specific gravity of the cement shall be not less than 3.10. Should the cement as received fall below this requirement, a second test may be made upon a sample heated for 30 minutes at a very dull red heat.

Fineness

4. Ninety-two per cent of the cement, by weight, shall pass through the No. 100 sieve, and 75 per cent shall pass through the No. 200 sieve.

Soundness

5. Pats of neat cement prepared and treated as hereinafter prescribed shall remain firm and hard and show no sign of distortion, checking, cracking or disintegrating. If the cement fails to meet the prescribed steaming test, the cement may be rejected or the steaming test repeated after seven or more days at the option of the engineer.

Time of Setting

6. The cement shall not acquire its initial set in less than 45 minutes and must have acquired its final set within 10 hours.

Tensile Strength

7. Briquettes made of neat cement, after being kept in moist air for 24 hours and the rest of the time in water, shall develop tensile strength per square inch as follows:

	Pounds
After 7 days	500
After 28 days	600

8. Briquettes made up of 1 part cement and 3 parts standard Ottawa sand, by weight, shall develop tensile strength per square inch as follows:

	Pounds
After 7 days	200
After 28 days	275

9. The average of the tensile strengths developed at each age by the briquettes in any set made from one sample is to be considered the strength of the sample at that age, excluding any results that are manifestly faulty.

10. The average strength of the sand mortar briquettes at 28 days shall show an increase over the average strength at 7 days.

Brand

11. Bids for furnishing cement or for doing work in which cement is to be used shall state the brand of cement proposed to be furnished and the mill at which made. The right is reserved to reject any cement which has not established itself as a high-grade Portland cement, and has not been made by the same mill for two years and given satisfaction in use for at least one year under climatic and other conditions at least equal in severity to those of the work proposed.

Packages

12. The cement shall be delivered in sacks, barrels, or other suitable packages (to be specified by the engineer), and shall be dry and free from lumps. Each package shall be plainly labeled with the name of the brand and of the manufacturer.

13. A sack of cement shall contain 94 pounds net. A barrel shall contain 376 pounds net. Any package that is short weight or broken or that contains damaged cement may be rejected, or accepted as a fractional package, at the option of the engineer.

Inspection

14. The cement shall be tested in accordance with the standard methods hereinafter prescribed. In general the cement will be inspected and tested after delivery, but partial or complete inspection at the mill may be called for in the specifications or contract. Tests may be made to determine the chemical composition, specific gravity, fineness, soundness, time of setting, and tensile strength, and a cement may be rejected in case it fails to meet any of the specified requirements. An agent of the contractor may be present at the making of the tests or they may be repeated in his presence.

15. In case of the failure of any of the tests, and if the contractor so desires, the engineer may, if he deem it to the interest of the United States, have any or all of the tests made or repeated by the Bureau of Standards, United States Department of Commerce and Labor, in the manner hereinafter specified, all expenses of such tests to be paid by the contractor. All such tests shall be made on samples furnished by the engineer.

Chemical

The composition of normal Portland cement has been the subject of a great deal of investigation and it can be said that the quantities of silica, alumina, oxide of iron, lime, magnesia, and sulphuric anhydride can vary within fairly wide limits without materially affecting the quality of the material.

A normal American Portland cement which meets the standard specifications for soundness, settling time and tensile strength, has an approximate composition within the following limits:

	Per cent.
Silica	19-25
Alumina	5-9
Iron oxide	2-4
Lime	60-64
Magnesia	1-4
Sulphur trioxide	1-1.75
Loss on ignition	0.5-3.00
Insoluble residue	0.1-1.00

It is also true that a number of cements have been made both here and abroad which have passed all standard physical tests in which these limits have been exceeded in one or more particulars, and it is equally true that a sound and satisfactory cement does not necessarily result from the above composition.

It is probable that further investigation will give a clearer understanding of the constitution of Portland cement, but at present chemical analysis furnishes but little indication of the quality of the material.

Defective cement usually results from imperfect manufacture, not from faulty composition. Cement made from very finely ground material, thoroughly mixed and properly burned, may be perfectly sound when containing more than the usual quantity of lime, while a cement low in lime may be

entirely unsound, due to careless manufacture.

The analysis of a cement will show the uniformity in composition of the product from individual mills, but will furnish little or no indication of the quality of the material. Occasional analysis should, however, be made for record and to determine the quantity of sulphuric anhydride and magnesia present.

The ground clinker as it comes from the mill is usually quick setting, which requires correction. This is usually accomplished by the addition of a small quantity of more or less hydrated calcium sulphate, either gypsum or plaster of Paris. Experience and practice have shown that an addition of 3 per cent or less is sufficient for the purpose.

Three per cent of calcium sulphate ($CaSO_4$) contains about 1.75 per cent sulphuric anhydride (SO_3), and as this has been considered the maximum quantity necessary to control time of set, the specification limits the SO_3 content to 1.75 per cent.

The specification prohibits the addition of any material subsequent to calcination except the 3 per cent. of calcium sulphate permitted to regulate time of set. Other additions may be difficult or impossible to detect even by a careful mill inspection during the process of manufacture, but as the normal adulterant would be ground raw material, an excess of "insoluble residue" would reveal the addition of silicious material, and an excess in "loss on ignition" would point to the addition of calcareous material when either is added in sufficient quantity to make the adulteration profitable.

The effect of relatively small quantities of magnesia (MgO) in normal Portland cement, while still under investigation, can be considered harmless. Earlier investigators believed that as magnesia had a slower rate of hydration than lime, the hydration of any free magnesia (MgO) present would occur after the cement had set and cause disintegration.

The effect of magnesia was considered especially injurious when the cement was exposed to the action of sea water. More recent investigation has shown that cement can be made which is perfectly sound under all conditions when containing 5 per cent. of magnesia, and it has also been found that the lime in Portland cement exposed to sea water is replaced by magnesia.

The maximum limit for magnesia has been set at 4 per cent, as it has been established that this quantity is not injurious and it is high enough to permit the use of the large quantities of raw material available in most sections of the country.

SPECIFICATIONS FOR YELLOW PINE RAILROAD CROSS TIES.

Standard Sizes: 7 in. x 9 in. x 8 ft. 6 in.; 6 in. x 9 in. x 8 ft.; 6 in. x 8 in. x 8 ft.

STANDARD QUALITY (HEARTS)

First Class Ties. All ties to be manufactured from Georgia or Florida long leaf yellow pine timber, of good sound quality, straight, and free from loose or unsound knots, wind shakes, or other imperfections that would affect their strength or durability. Ties to be hewn smooth on four sides, with ends sawed square.

One inch of sap will be allowed on each corner measured across the face.

Second Class Ties. The same as first class, except one inch less on face; also ties of first class size, which have slight defects not materially impairing their usefulness, but which excludes them from first class. Not over ten (10) per cent. of second class ties to be shipped on an order for first class ties.

SOUND AND SQUARE EDGE QUALITY (SAPS)

Ties gotten out under standard quality regardless of sap.

Navy Department Specifications

YELLOW-PINE LUMBER FOR NAVY YARD AND SHIP USE.

39P1. February 5, 1913. Superseding "39P1," June 10, 1912.

General Rules

All lumber must be sound, commercial long-leaf yellow pine, except that pine combining large, coarse knots with coarse grain will not be accepted; must be well manufactured, full to size, saw butted, and shall be free from the following defects: Unsound, loose and hollow knots, worm holes and knot holes, through shakes or round shakes that show on the surface; and shall be square edge unless otherwise specified.

A through shake is hereby defined to be through or connected from side to side, or edge to edge, or side to edge.

In the measurement of dressed lumber the width and thickness of the lumber before dressing must be taken; lumber less than 1 inch thick shall be measured as 1 inch.

To comprise yellow-pine boards, planks, ceiling, flooring, decking, margin pieces, hewn timber, and hewn sticks for masts and spars.

When factory inspection is made, the Government inspector will plainly mark with proper stamp all lumber, 1 inch in thickness and above, on ends in such manner that the material can be easily identified at destination as having been inspected.

Note.—These specifications conform in general to "Rules Regulating the Classification and Inspection of Yellow Pine Lumber," generally known as "Interstate Rules."

No. 1 Yellow Pine

1. I. Boards (thickness under 2 inches).—Must be bright, with heart face both sides, except that 1 inch of bright sap is allowed on the one edge for widths 8 inches and under. For greater widths allowance of bright sap in proportion to width. To be free from splits, shakes, and centers. Must be free from wane. Sound, tight knots will be allowed as follows: For widths under 11 inches, one knot of 1¼ inches diameter for each 6 feet of length. For widths of 11 inches and over, one knot of 1½ inches diameter for each 6 feet of length. Fifty per cent of the total number of pieces must be free from knots.

2. II. Planks (thicknesses of 2 inches and over up to 5¾ inches.)—Must be bright and free from splits, shakes, and centers. Must be free from wane. One side to show all heart and the other side to show not over 1/6 bright sap on the face.

(a) In widths under 9 inches, sound, tight knots will be allowed as follows: Thicknesses up to 3¾ inches, one knot of 1¼ inches diameter for each 6 feet of length. Thicknesses of 4 inches and over, one knot of 1¾ inches diameter for each 6 feet of length. Fifty per cent of the pieces to be clear of knots.

(b) In widths of 9 inches and over, sound, tight knots will be allowed as follows: Thicknesses up to 4¾ inches, one knot of 1½ inches diameter for each 6 feet of length. Forty per cent of the pieces to be clear of knots. Thicknesses of 5 inches and over, one knot of 1¾ inches diameter for each 6 feet of length. Forty per cent of the pieces to be clear of knots.

3. III. Dimension sizes (6 inches thick and over).—Must be bright and free from splits and shakes. Must be free from wane. No face to show more than 1/6 of the width of the face sap. Sound, tight knots will be allowed as follows:

(a) For thicknesses under 8 inches, one knot of 2 inches diameter for each 6 feet of length.

(b) For thicknesses of 8 inches and over the size of knots may be proportionately larger.

No. 2 Yellow Pine (Prime)

4. I. Boards.—Must be bright, free from centers, round or through shakes, and large or unsound knots.

(a) Widths 7 inches and under must show one heart face.

(b) Widths over 7 inches must show two-thirds heart on both sides.

5. II. Plank.—Must be bright, free from round or through shakes, and large or unsound knots at least 50 per cent to be free from centers.

(a) Widths 7 inches and under must show three corners heart.

(b) Widths over 7 inches must show two-thirds heart on both sides.

6. III. Dimension sizes.—Must be bright and free from injurious shakes and knots.

(a) Square lumber must show two-thirds heart on two sides and not less than one half heart on two other sides.

(b) Sizes where width does not exceed thickness by 3 inches must show two-thirds heart on face and heart edges for two-thirds of length.

(c) Sizes where width exceeds thickness by 3 inches or more shall show two-thirds

heart on face and heart on edges for one-half the length. Wane may be allowed ⅛ of the width of the piece measured across face of wane extending ¼ of the length on one corner or its equivalent on two or more corners, provided that not over 10 per cent of the pieces of any one size shall show such wane.

Merchantable Yellow Pine

All sizes under 9 inches shall show some heart the entire length on one side; sizes 9 inches and over shall show some heart the entire length on two opposite sides. Wane may be allowed ⅛" of the width of the piece measured across face of the wane, and extending ¼ of the length of the piece on one corner or its equivalent on two or more corners, provided that not more than 10 per cent of any size shows such wane.

No piece poorer than merchantable will be accepted.

No. 1 Yellow-pine Ceiling

7. To be best quality clear yellow pine; to be well seasoned and well manufactured, and free from all defects. To be matched, dressed, and center beaded on both sides; width and thickness as may be ordered. Length to be from 12 to 16 feet.

Yellow-pine Flooring (Vertical Grain)

8. To be best quality long-leaf yellow pine. Must be all heart, except that 1 inch of bright sap will be allowed on one corner to be rift or vertical grain the entire length, free from splits, shakes, and knots; the heart face must be free from pitch pockets and resin streaks; to be well seasoned, matched, and dressed on both sides. Width and thickness to be as ordered; length to be from 12 to 16 feet. Flooring shall show one heart face regardless of sap opposite side free from through or round shakes or knots exceeding 1 inch in diameter or more than four in a board on the face side.

Yellow-pine Decking

9. To be of best quality fine-grained, long-leaf yellow pine, that has not been tapped, from the Gulf ports; to be in lengths 16 to 40 feet and up, averaging at least 24 feet; to be well manufactured, well seasoned, and sawed fair and full to the sizes given. To be all heart and edge grain, free from splits, shakes, heart centers, and corner knots; 2 by 5 inches, 2 by 6 inches, 3 by 3 inches, 3 by 4 inches, 3 by 5 inches, 3 by 6 inches, and intermediate sizes to have no knots exceeding 1 inch in diameter; smaller sizes to have no knots exceeding ¾ inch in diameter; larger sizes to have no knots exceeding 1½ inches diameter.

10. Perfectly sound, tight knots up to the sizes given above will be allowed on the under side of piece or in the lower half of calking edges, but no knots must show on corners after working.

11. In square decking one face and in other decking one wide face must be absolutely clear and must show edge grain its entire length.

Margin Pieces

12. To conform in quality to the above specifications, except the requirements as to edge grain, which are modified as follows:

Up to 6½ inches in width, to show all-edge grain.

Seven to 9½ inches, inclusive, to show 6 inches edge grain, all on one side.

Ten inches and over, no requirement as to edge grain, and bright sap allowed on lower face and sides not to exceed a total of ⅛ of the width or ¼ of the thickness.

Yellow-pine Hewn Timber

13. To be in lengths from 25 to 70 feet and to average at least 40 feet. No stick to contain less than 600 feet board measure; at least 50 per cent of the total to average 1,500 feet board measure, and the remainder at least 1,000 feet board measure.

14. To be best quality fine-grained, long-leaf yellow pine from the Gulf ports. To be sound and free from rot, red heart, twisted growth, and cat face. To be free from unsound, rotten, or injurious knots. No sound knot to exceed 3 inches in diameter, and the number of knots in each stick not to exceed one to every 7 feet of length. To be free from injurious rotten shakes, wind shakes, or resin shakes. To be practically straight. Taper to be uniform and not to exceed 1 inch in 15 running feet. Must be well manufactured; hewn on four sides, a few slight ax marks being allowed. May show 1½ inches wane on all four corners, or not exceeding 3 inches of wane on only one corner of any stick, nor for more than one-half the length of same. Not over 25 per cent of the number of pieces to show score hacks, subject to an allowance of 1 inch measured off, each side showing same, and no score hacks allowed deeper than one-half inch

on any face. To show heartwood at least one-third the length on two faces and one-fifth the length on other two sides.

15. Measurement to be as follows:

The length to be taken inside the pinholes, and the breadth and depth to be taken at the middle of the stick, which, with the length, shall be considered size for computation. Trimming must be done if found necessary. Each log to be plainly numbered on both ends, corresponding number to be given on invoice followed by size of log.

Yellow Pine—Hewn Sticks for Masts and Spars

16. Lengths to be from 65 to 85 feet and up, averaging 70 feet. To be from 17 to 24 inches in diameter at middle of length, and to average at least 2,200 feet board measure to stick. To be best quality fine-grained, long-leaf yellow pine from the Gulf ports. To be sound and free from rot, red heart, twisted growth, and cat face.

17. To be straight; no sweep allowed. Taper to be uniform, and not to exceed 1 inch in 15 running feet. May show 3 inches wane on each corner, or such an amount as will, in the judgment of the inspector, not injure the sticks for the purpose intended. Must be fairly manufactured; hewn on four sides; a few slight ax marks will be allowed. Not over 25 per cent to show score hacks, subject to an allowance of 1 inch measured off each side showing same, and no score hack allowed deeper than one-half inch.

18. To show heart at least one-third of the length on each of the four sides.

19. To be free from unsound, rotten, or injurious knots. No sound knots to exceed 3 inches in diameter, and the number of knots in each piece not to exceed one to every 7 feet in length. To be free from wind, resin, or any other injurious shake.

20. Measurement to be as follows:

The length to be taken inside of pinholes. The breadth and depth at the middle of the length shall, with the length, be considered the size for computation. Trimming must be done if found necessary.

Note.—Copies of the above specifications can be obtained upon application to the various Navy pay offices or to the Bureau of Supplies and Accounts, Navy Department, Washington, D. C.

REFERENCES: C. and R., 39P1 (AP), May 23, 1912. C. and R., Z39P1 (AT), Dec. 31, 1912. S. and A., 112083.

SOUTHERN LUMBER AND TIMBER ASSOCIATION RULES OF FEBRUARY 14TH, 1883.

KNOWN AS THE RULES OF "83."

Classification

Flooring shall embrace four and five quarter inches in thickness by three to six inches in width. For example: 1x3, 4, 5 and 6; 1¼x3, 4, 5 and 6.

Boards shall embrace all thicknesses under one and a half inches by seven inches and up wide, including one and a half inches in thickness by seven inches in width. For example, ¾, 1, 1¼ and 1½ inches thick by 7 inches and up wide.

Scantling shall embrace all sizes from two to five inches in thickness and two to six inches in width. For example: 2x2, 2x3, 2x4, 2x5, 2x6, 3x3, 3x4, 3x5, 3x6, 4x4, 4x5, 4x6, 5x5 and 5x6.

Plank shall embrace all sizes from one and one-half inches to six inches in thickness, not including six inches by seven inches and up in width. For example: 1½, 2, 2½, 3, 3½, 4, 4½, 5, 5¼, 5½, 5¾x7 inches and over wide.

Dimension sizes shall embrace all sizes six inches and up in thickness by seven inches and up in width including six by six. For example: 6x6, 6x7, 7x7, 7x8, 8x8, 8x9 and up.

Stepping shall embrace one to two and half inches in thickness by seven inches and up in width. For example: 1, 1¼, 1½, 2 and 2½ by 7 inches and up wide.

Rough-edge or Flitch shall embrace all sizes one inch and up in thickness by eight inches and up in width, sawed on two sides only. For example: 1, 1½, 2, 3, 4 and up thick by 8" and up wide, sawed on two sides only.

Square Edge Inspection

Flooring shall show no wane, shall be free from through or round shakes or knots exceeding 1½ inches in diameter, or more than six in a board; sap no objection.

Boards shall show no wane, shall be free from round or through shakes, large or unsound knots; sap no objection.

Scantling shall be free from injurious shakes, unsound knots, or knots that impair strength; sap no objection.

Plank shall be free from unsound knots, wane, through or round shakes. Sap no objection.

Dimension sizes—Sap no objection; no wane edges, no shakes to show on outside of stick.

All stock to be well and truly manufactured, full to sizes and saw butted.

Merchantable Inspection

Flooring shall show one heart face, regardless of sap on opposite side, free from through or round shakes or knots exceeding one inch in diameter, or more than four in a board on the face-side.

Boards nine inches and under wide shall show one heart face and two-thirds heart on opposite side; over nine inches wide shall show two-thirds heart on both sides all free from round or through shakes, large or unsound knots.

Scantling shall show three corners heart, free from injurious shakes or unsound knots.

Plank nine inches and under wide shall show one heart face and two-thirds heart on opposite side; over nine inches wide show two-thirds heart on both sides, all free from round or through shakes, large or unsound knots.

Dimension sizes—All square lumber shall show two-thirds heart on two sides and not less than one-half heart on two other sides. Other sizes shall show two-thirds heart on faces, and show heart two-thirds of the length on edges, excepting where the width exceeds the thickness by three inches or over, then it shall show heart on the edges for one-half the length.

Stepping shall show three corners heart, free from shakes and all knots exceeding one-half an inch in diameter, and not more than six in a board.

Rough-edge or Flitch shall be sawed from good heart timber, and shall be measured in the middle on the narrow face, free from injurious shakes or unsound knots.

All stock to be well and truly manufactured, full to size and saw butted.

Prime Inspection

Flooring shall show one entire heart face and two-thirds heart on the opposite side, clear of splits, shakes or knots exceeding one inch in diameter, or more than four in a board.

Boards shall show one heart face and two-thirds heart on opposite side, free from shakes and large or unsound knots.

Scantling shall show three corners heart and not to exceed one inch of sap on fourth corner, measured diagonally, free from heart shakes, large or unsound knots.

Plank shall show one entire heart face; on opposite face not exceeding one-sixth its width of sap on each corner, free from unsound knots, through or round shakes; sap to be measured on face.

Dimension Sizes—On all square sizes the sap on each corner shall not exceed one-sixth the width of the face. When the width does not exceed the thickness by three inches, to show one-half heart on narrow faces the entire length exceeding three inches, to show heart on narrow faces the entire length; sap on wide faces to be measured as on square sizes.

Rough-edge or Flitch shall be measured in the middle on narrow face, inside of sap free from shakes or unsound knots.

Clear Inspection

Flooring, Stepping and Boards shall be free of knots, sap, pitch, and all other defects.

Scantling shall be free of sap, large knots and other defects.

Plank shall be free of sap, large knots or other defects.

Dimension sizes shall be free from sap, large or unsound knots, shakes through or round.

STANDARD WEIGHTS OF CYPRESS LUMBER

	Lbs. per M.
Lumber, rough, 2 inches and under	3,000
Lumber, rough, 2½ and 3 inches	3,500
13/16-inch Flooring and Ceiling	2,200
½-inch Ceiling	1,600
13/16-inch Ceiling	1,300
⅜-inch Ceiling	1,000
½-inch Bevel Siding	1,000
Shingles, all grades	300
⅜-inch Plaster Lath	500
⅝-inch Fence Lath	900
1¼ x 1¾ x 4 D. & H. Pickets	1,200
¾ x 2½ x 4 D. & H. Pickets	1,700
2-inch O. G. Battens	300
2½-inch O. G. Battens	350
3-inch O. G. Battens	400

STANDARD WEIGHT WASHINGTON RED CEDAR SHINGLES

	Lbs. per M.
Perfection, 18 inches	220
Puget A, 18 inches	220
Eureka, 18 inches	200
Skagit A, 18 inches	200
Extra Clear, 16 inches	180
Choice A, 16 inches	180
Extra A, 16 inches	160
Standard A, 16 inches	160

WEIGHTS OF SHINGLES AND LATH

	Lbs. per M.
Red Cedar, 16", 6 to 2"	160
Red Cedar, 16", 5 to 2"	180
Red Cedar, 18", 5 to 2"	200
Red Cedar, 18", 5 to 2¼"	220
Redwood, 16", 5 to 1¾"	175
White Cedar, 16"	200
Pine, 16"	225
Cypress, 16"	300
Hemlock, 16"	225
LATH	
Pine, ⅜ x 1½", 4'	400
Norway	450
Cypress	500
Hemlock	450
Red Cedar	350
Fir	500
Yellow Pine	500
Basswood	500
Sheathing, lath, B. M.	1,500

TO FIND THE NUMBER OF SHINGLES REQUIRED FOR A ROOF

Multiply the length of the ridge pole by twice the length of one rafter. If the shingles are to be exposed 4½ inches to the weather, multiply by 9; if 5 inches to the weather, multiply by 8, which gives you the number of shingles needed.

Shingles are packed in bundles of 250 each; 900 shingles, laid 4 inches to the weather, will cover 100 square feet of roof; 800 shingles, laid 4½ inches to the weather, will cover 100 square feet. Five pounds of shingle nails will fasten them on.

The weight of 1,000 shingles is approximately 250 pounds.

NAILS REQUIRED IN CARPENTER WORK

To case and hang door, 1 pound.

To case and hang one window, ¼ pound.

Base, 100 lineal feet, 1 pound.

To put on rafters, joists, etc., 3 pounds to 1,000 feet.

To put up studding, 3 pounds to 1,000 feet.

To lap a 6-inch pine floor, 15 pounds to 1,000 feet.

NUMBER OF NAILS TO THE POUND

Size.	No. per lb.
6 penny fence, 2 inches	80
8 penny fence, 2½ inches	50
10 penny fence, 3 inches	34
12 penny fence, 3¼ inches	39
3 penny fine, 1⅛ inches	760
3 penny, 1¼ inches	480
4 penny, 1½ inches	300
5 penny, 1¾ inches	200
6 penny, 2 inches	160
7 penny, 2¼ inches	128
8 penny, 2½ inches	92
9 penny, 2¾ inches	72
10 penny, 3 inches	60
12 penny, 3¼ inches	44
16 penny, 3½ inches	32
20 penny, 4 inches	24
30 penny, 4¼ inches	18
40 penny, 5 inches	14
50 penny, 5½ inches	12

TO FIND THE NUMBER OF LATH REQUIRED FOR A ROOM

Find the number of square yards in the walls and ceiling and multiply by 16, the number estimated to a square yard. The result will be the number of lath necessary to cover the room.

Most lath are 4 feet long and 1½ inches wide, and they are put up in bunches of 50. The weight of 1,000 pine lath is approximately 450 pounds.

At 16 lath to the square yard, 1,000 lath will cover 63 yards of surface, and 11 pounds of lath nails will nail them on.

HOW TO FIGURE PLASTERING

Multiply the distance around the four sides of the room in feet by the height of the room in feet. Multiply the product by the price per square yard and divide this product by 9, because there are 9 square feet in a square yard. For the ceiling, multiply the length of the room by the width of the room in feet and then by the price per square yard, and divide by 9 as before. Add these two results and you have the entire cost of plastering the room.

To every barrel of lime estimate about ⅝ of a cubic yard of good sand for plastering.

One-third of a barrel of stucco will hard finish 100 square yards of plastering.

Six bushels of lime, 40 cubic feet of sand and 1½ bushels of hair will plaster 100 square yards with two coats of mortar.

In plastering, no deductions are made for openings, because it is considered that the extra work in finishing around them balances the material saved.

STONE AND BRICK WORK

A cord of stone (128 cubic feet), 3 bushels of lime (there are about 1¼ cubic feet in a bushel), and a cubic yard of sand will make 100 cubic feet of wall.

To find the number of cords of stone needed to build a foundation wall, multiply together the length, height, and thickness in feet and divide by 156.

A cubic yard of sand is called a load.

Five hundred bricks make a load.

A bricklayer's hod will hold 20 bricks. An ordinary bricklayer can lay 1,500 bricks in a day of ten hours, where the joints are left rough; about 1,000 bricks a day when both faces are to be worked fair; and not more than 500 a day when carefully joined and faced with picked bricks of a uniform color.

Three-fourths of a cubic yard of sand and ¼ barrels of cement will lay 100 feet of rubble stone.

Five-eighths of a cubic yard of sand and ⅜ barrels of lime will lay 1,000 bricks.

Five courses of bricks will make one foot in height.

STANDARD SPECIFICATIONS, WEIGHTS AND MEASUREMENTS

of

Railroad Ties, Round and Octagonal Poles, Cross Arms, Piling and Insulator Pins and Brackets

RAILROAD TIES

Long Leaf Yellow Pine—Hewed or Sawed

7″x9″x8½	ft.	standard	1″	Sap	on	corners
7″x8″x8½	ft.	"	"	"	"	"
7″x9″x8	ft.	"	"	"	"	"
7″x8″x8	ft.	"	"	"	"	"
6″x9″x8	ft.	"	"	"	"	"
6″x8″x8	ft.	"	"	"	"	"
6″x8″x8	ft.	Savannah Merchantable				
6″x8″x8	ft.	Sound and Square Edge				

Southern Cypress—Hewed or Sawed

6″x6″ and up face x 8 ft.
6″x8″x8 ft.

Must be strictly Red Cypress.

Chestnut and Oak—Hewed and Sawed

Mixed Oak	7″ x 7″ x 8½	ft.
" "	7″ x 6″ x 8½	ft.
" "	6″ x 9″ x 8	ft.
" "	6″ x 8″ x 8	ft.
" "	6″ x 7″ x 8	ft.
" "	6″ x 6″ and up	8 ft.
Chestnut	6″ x 9″ x 8	ft.
"	6″ x 8″ x 8	ft.
"	6″ x 7″ x 8	ft.
"	6″ x 6″ x 8	ft.
"	6″ x 6″ and up	8 ft.
"	5″ x 6″ and up	7 ft.

Yellow Pine Octagonal Poles

Standard Sizes	Approximate Weight
5″ top 8″ butt 25 ft. long	325 lbs.
6″ “ 8″ “ 25 “ “	400 “
7″ “ 9″ “ 25 “ “	532 “
7″ “ 9″ “ 28 “ “	600 “
7″ “ 10″ “ 28 “ “	675 “
7″ “ 10″ “ 30 “ “	725 “
7″ “ 11″ “ 30 “ “	815 “
8″ “ 10″ “ 30 “ “	808 “
8″ “ 12″ “ 30 “ “	1000 “
7″ “ 10″ “ 32 “ “	768 “
8″ “ 12″ “ 32 “ “	1070 “
7″ “ 10″ “ 35 “ “	840 “
7″ “ 12″ “ 35 “ “	1050 “
8″ “ 12″ “ 35 “ “	1170 “
7″ “ 12″ “ 40 “ “	1275 “
8″ “ 14″ “ 40 “ “	1720 “
7″ “ 13″ “ 45 “ “	1600 “
7″ “ 14″ “ 50 “ “	1950 “
7″ “ 15″ “ 55 “ “	2360 “
7″ “ 15″ “ 60 “ “	2575 “

Poles must be strictly sound, free from rot, rotten knots, shakes, splits, large cluster knots or any defect to weaken the pole.

Standard manufacture and quality, sawed octagonal tapering, top pointed, butts tarred for six feet, balance pole painted primer coat heavy filled paint, absolutely sound in every respect.

Chestnut Poles—Round

Poles must be cut from live growing timber, peeled and reasonably well proportioned, tops must be sound and butts must not contain more than 10% butt rot, wind shakes shall not exceed one ring and this must not be an open shake. Rough knots, if sound and trimmed, shall not be considered a defect. Must be commercially straight, and have ends cut square.

Tops for a 7″ pole must measure 22″ circumference if a seasoned pole, and if green or wet, 22¾″. Eight-inch pole if dry must measure 25″ circumference and if green or wet, 26″ circumference.

Size	Estimated Weight
5″ top 25 ft. long	300 lbs.
6″ “ 25 “ “	500 “
7″ “ 25 “ “	575 “
8″ “ 25 “ “	640 “
6″ “ 30 “ “	600 “
7″ “ 30 “ “	720 “
8″ “ 30 “ “	900 “
6″ “ 35 “ “	800 “
7″ “ 35 “ “	900 “
8″ “ 35 “ “	1050 “
6″ “ 40 “ “	1100 “
7″ “ 40 “ “	1250 “
8″ “ 40 “ “	1350 “
6″ “ 45 “ “	1250 “
7″ “ 45 “ “	1400 “
8″ “ 45 “ “	1550 “
6″ “ 50 “ “	1600 “
7″ “ 50 “ “	1800 “
8″ “ 50 “ “	2000 “
7″ “ 55 “ “	1950 “
8″ “ 55 “ “	2150 “
7″ “ 60 “ “	2400 “
8″ “ 60 “ “	2600 “
7″ “ 65 “ “	2700 “
8″ “ 65 “ “	2800 “
7″ “ 70 “ “	3000 “
8″ “ 70 “ “	3200 “
7″ “ 75 “ “	3600 “
8″ “ 75 “ “	3800 “

Cypress Poles

Size	Estimated Weight
8″ top 30 ft. long	900 lbs.
8″ “ 35 “ “	1100 “
8″ “ 40 “ “	1400 “
8″ “ 50 “ “	1700 “

Southern Juniper Poles

Size	Estimated Weight
5″ top 20 ft. long	150 lbs.
6″ “ 20 “ “	200 “
7″ “ 20 “ “	250 “
5″ “ 25 “ “	225 “
6″ “ 25 “ “	285 “
7″ “ 25 “ “	365 “
8″ “ 25 “ “	450 “
6″ “ 30 “ “	400 “
7″ “ 30 “ “	450 “
8″ “ 30 “ “	540 “
6″ “ 35 “ “	500 “
7″ “ 35 “ “	580 “
8″ “ 35 “ “	700 “
6″ “ 40 “ “	850 “
7″ “ 40 “ “	900 “
6″ “ 45 “ “	950 “
7″ “ 45 “ “	1050 “
6″ “ 50 “ “	1100 “
7″ “ 50 “ “	1200 “
7″ “ 55 “ “	1550 “
7″ “ 60 “ “	1800 “

Yellow Pine Cross Arms—Finished Standard Sizes

3¼" x 4¼"—Quality ¾ Heart.
2¾" x 3¾"—Quality ¾ Heart.
3¼" x 4¼"—Quality Standard.
Weight 3 to 3½ lbs. per lineal ft.

Length of Arms	Pin Holes		Spacings			Centre Lag Bolt Holes	Brace Holes		
	No.	Size	End	Centre	Side		No.	Size	Spac'g
2 ft. 4 ft.	2	1½	4	20	. . .	2-½ ang	.....	.....	....
3 ft.	2	1½	4	28	.....	2-½ "	.....	.....	....
4 ft.	4	1½	4	16	12	2-½ "	.....	.....	.....
5 ft.	4	1½	4	18	17	2-½ "	.....	.....	.....
6 ft.	4	1½	4	24	20	1-⅝ st.	2	⅜	21
6 ft.	6	1½	4	16	12	1-⅝ "	2	⅜	21¼
8 ft.	6	1½	4	18	17½	1-⅝ "	2	⅜	21
8 ft.	8	1½	4	16	12	1-⅝ "	2	⅜	21¼
9 ft.	....	....	....	.....	.....	.....	.....	.....	.....
10 ft.	8	1½	4	17½	15¼	1-⅝ "	2	⅜	21
10 ft.	10	1½	4	16	12	1-⅝ "	2	⅜	21¼
6 ft.	6	1⅜	4	16	12	1-⅝ "	2	⅜	21
10 ft.	10	1⅜	4	16	12	1-⅝ "	2	⅜	21

Special Sizes for Heavy Work.

3½" x 4½"	weight 3½ to 4 lbs.	lineal foot
4" x 5"	" " "	"
3¾" x 4½"	" 5 to 5½ lbs.	"
4½" x 5½"	" "	"
3¾" x 4¾"	" 5¾ lbs.	"
5" x 6"	" "	"

Insulator Pins and Brackets

Standard Sizes, Approximate weight per M. and quality given in the following:

Oak Pins, overstock, 1¼" x 8", 275 lbs., standard quality.

Oak Pins, painted, 1½" x 9", 400 lbs., standard quality.

Oak Pins, painted, 1¼" x 8", 275 lbs., standard quality.

Locust Pins, 1½" x 9", 450 lbs., standard grade.

Locust Pins, 1½" x 9", 450 lbs., Commercial.

Locust Pins, 1¼" x 8", 300 lbs., standard grade.

Locust Pins, 1¼" x 8", 300 lbs., commercial.

Painted Oak Brackets, 1½" x 2 x 12", 650 lbs., standard.

Painted Oak Brackets, 1⅝" x 2" x 12", 700 lbs., standard.

Painted Oak Brackets, 1½" x 2" x 10", 500 lbs., standard.

Painted Oak Brackets, 2" x 2¼" x 12", 850 lbs., standard.

Pole Steps, 1¾" x 3" x 7½", 500 lbs., plain.

Pole Steps, 1¾" x 3" x 7½", 500 lbs., creosoted.

WEIGHTS OF DOORS, SASH AND BLINDS.

DOORS.

Size.	1⅛	1⅜	1¾
4 Panel, 2- 6 x 6- 6	30 lbs.	35 lbs	42 lbs.
4 " 2- 8 x 6- 8	32 "	37 "	46 "
4 " 2-10 x 6-10	35 "	40 "	52 "
4 " 3 x 7	38 "	45 "	55 "

Four Panel, 2 ft. 6 in. x 6 ft. 6 in., 26 lbs.

FOUR LIGHT WINDOWS, CHECK RAIL.

Size.	Thickness.	Glazed.	Unglazed.
12 x 24.....	1⅜	20 lbs.	8 lbs
12 x 28.....	"	22 "	9 "
12 x 32.....	"	25 "	11 "
12 x 36.....	"	27 "	12 "
14 x 30... ...	"	27 "	12 "
14 x 32.....	"	29 "	12 "
14 x 34.....	"	35 "	13½ "
14 x 36.....	"	32 "	13 "

EIGHT LIGHT WINDOWS.

9 x 12.....	1⅛	14 lbs.	6 lbs.
10 x 14.....	"	18 "	8 "
10 x 16.....	"	20 "	9 "
12 x 14.....	1⅜	23 "	11 "
12 x 16.....	"	24 "	12 "
12 x 18.....	"	27 "	13 "
14 x 20.....	"	35 "	15 "

TWELVE LIGHT WINDOWS.

8 x 10.....	1⅛	17 lbs.	7 lbs
9 x 12.....	"	20 "	9 "
9 x 12.....	1⅜	22 "	10 "
10 x 14.....	"	26 "	12 "
10 x 16.....	"	29 "	13 "
10 x 18.....	"	32 "	13 "

Mouldings, 1 x 1 inch, per 100 feet lineal, 16 lbs.

WEIGHTS AND MEASURES.

Troy Weight.

24 grains=1 pwt. 12 ounces=1 pound.
20 pwts.=1 ounce.
Used for weighing gold, silver and jewels.

Apothecaries' Weight.

20 grains=1 scruple. 8 drams=1 ounce.
3 scruples=1 dram. 12 ounces=1 pound.
The ounce and pound in this are the same as in Troy weight.

Avoirdupois Weight.

27 11-32 grains=1 dram. 4 quarters=1 cwt.
16 drams=1 ounce. 2,000 lbs.=1 short ton.
16 ounces=1 pound. 2,240 lbs.=1 long ton.
25 pounds=1 quarter.

Dry Measure.

2 pints=1 quart. 4 pecks=1 bushel.
8 quarts=1 peck. 36 bushels=1 chaldron.

Liquid Measure.

4 gills=1 pint. 31½ gallons=1 barrel.
2 pints=1 quart. 2 barrels=1 hogshead.
4 quarts=1 gallon.

Time Measure.

60 seconds=1 minute. 24 hours=1 day.
60 minutes=1 hour. 7 days=1 week.
28, 29, 30 or 31 days=1 calendar month (30 days=1 month in computing interest).
365 days=1 year. 366 days=1 leap year.

Circular Measure.

60 seconds=1 minute. 30 degrees=1 sign.
60 minutes=1 degree. 90 degrees=1 quadrant.
4 quadrants=12 signs, or 360 degrees=1 circle.

Long Measure.

12 inches=1 foot. 40 rods=1 furlong.
3 feet=1 yard. 8 furlongs=1 sta. mile.
5½ yards=1 rod. 3 miles=1 league.

Cloth Measure.

2¼ inches=1 nail. 4 quarters=1 yard.
4 nails=1 quarter.

Mariners' Measure.

6 feet=1 fathom. 5,280 feet=1 stat. mile.
120 fathoms=1 cab. le'th. 6,085 feet=1 naut. mile.
7½ cable lengths=1 mile.

Miscellaneous.

3 inches=1 palm. 18 inches=1 cubit.
4 inches=1 hand. 21.8 in.=[Bible cubit.
6 inches=1 span. 2½ ft.=1 military pace.

Square Measure.

144 sq. inches=1 sq. foot. 40 sq. rods=1 rood.
9 sq. feet=1 sq. yard. 4 roods=1 acre.
30¼ sq. yds.=1 sq. rod. 640 acres=1 sq. mile.

Surveyors' Measure.

7.92 inches=1 link. 4 rods=1 chain.
25 links=1 rod.
10 square chains or 160 square rods=1 acre.
640 acres=1 sq. mile.
36 sq. miles (6 miles sq.)=1 township.

Cubic Measure.

1,728 cubic in.=1 cub. ft. 128 c. ft.=1 cord (wood)
27 cubic ft.=1 cubic yd. 40 cub. ft.=1 ton (shpg.)
2,150.42 cubic inches=1 standard bushel.
268.8 cubic inches=1 standard gallon.
1 cubic foot=about four-fifths of a bushel.

Metric Equivalents.

Linear Measure.

1 centimeter=0.3937 in. } 1 in.=2.54 centimeters.
1 decimeter=3.937 in.=0.328 feet. } 1 ft.=3.048 decimeters.
1 meter=39.37 in.=1.0936 yards. } 1 yard=0.9144 meter.
1 dekameter=1.9884 rods. 1 rod=0.5029 dekameter.
1 kilometer=0.62137 mile. 1 mile=1.6093 kilometers

Square Measure.

1 sq. centimeter=0.1550 sq. in. } 1 sq. inch=6.452 square centimeters.
1 sq. decimeter=0.1076 sq. ft. } 1 sq. foot=9.2903 square decimeters.
1 sq. meter=1.196 sq. yd. 1 sq. yd.=0.8361 sq. m'r.
1 are.=3.954 sq. rd. 1 sq. rd.=0.2529 are.
1 hektar=2.47 acres. 1 acre=0.4047 hektar.
1 sq. kilometer=0.386 sq. m. } 1 sq. m.=2.59 sq. kilometers.

Measure of Volume.

1 cu. centimeter=0.061 cu. in. } 1 cu. in.=16.39 cu. centimeters.
1 cu. decimeter=0.0353 cu. ft. } 1 cu. ft.=28.317 cu. decimeters.
1 cu. mr. = 1 stere = { 1.308 cu. yd. / 0.2759 cd. } 1 cu. yd.=0.7646 cu. m'r / 1 cord=3.624 steres.
1 liter= { 0.908 qt. dry. / 1.0567 qt. liq. } 1 qt. dry=1.101 liters. / 1 qt. liq.=0.9463 liter.
1 dekaliter= { 2.6417 gal. / .135 pks. } 1 gal.=0.3785 dekaliter. / 1 peck=0.881 dekaliter.
1 hektoliter=2.8375 bush. 1 bus.=0.3524 hektoliter.

Weights.

1 gram.=0.03527 ounce. 1 ounce=28.85 grams.
1 kilogram=2.2046 lbs. 1 lb.=0.4536 kilogram.
1 metric ton=1.1023 English ton. } 1 English ton=0.9072 metric ton.

Approximate Metric Equivalents.

1 decimeter=4 inches.
1 meter=1.1 yards.
1 kilometer=⅝ of mile.
1 hektar=2½ acres.
1 stere or cu. meter=¼ of a cord.
1 liter= { 1.06 qt. liquid. / 0.9 qt. dry. }
1 hektoliter=2¾ bush.
1 kilogram=2⅕ lbs.
1 metric ton=2,200 lbs.

Ready Reckoner

Showing number of feet in sticks
from 1"x1"—20 ft. to
36"x36"—50 ft. long

SIZE INCHES	LENGTH IN FEET					
	10	12	14	16	18	20
1 x 1	5/8	1	1 1/6	1 1/3	1 1/2	1 2/3
1 x 2	1 3/4	2	2 1/3	2 2/3	3	3 1/3
1 x 3	2 1/2	3	3 1/2	4	4 1/2	5
1 x 4	3 1/2	4	4 2/3	5 1/3	6	6 2/3
1 x 6	5	6	7	8	9	10
1 x 8	6 2/3	8	9 1/3	10 2/3	12	13 1/3
1 x 10	8 1/3	10	11 2/3	13 1/3	15	16 2/3
1 x 12	10	12	14	16	18	20
1 x 14	11 2/3	14	16 1/3	18 2/3	21	23 1/3
1 x 16	13 1/3	16	18 2/3	21 1/3	24	26 2/3
1 x 18	15	18	21	24	27	30
1 x 20	16 2/3	20	23 1/3	26 2/3	30	33 1/3
1 1/6 x 2	1 7/8	2 1/4	2 5/8	3	3 3/8	3 3/4
1 1/6 x 3	2 13/16	3 3/8	3 15/16	4 1/2	5 1/16	5 5/8
1 1/6 x 4	3 3/4	4 1/2	5 1/4	6	6 3/4	7 1/2
1 1/6 x 6	5 5/8	6 3/4	7 7/8	9	10 1/8	11 1/4
1 1/6 x 8	7 1/2	9	10 1/2	12	13 1/2	15
1 1/6 x 10	9 3/8	11 1/4	13 1/8	15	16 7/8	18 3/4
1 1/6 x 12	11 1/4	13 1/2	15 3/4	18	20 1/4	22 1/2
1 1/6 x 14	13 1/8	15 3/4	18 3/8	21	23 5/8	26 1/4
1 1/6 x 16	15	18	21	24	27	30
1 1/6 x 18	16 7/8	20 1/4	23 5/8	27	30 3/8	33 3/4
1 1/6 x 20	18 3/4	22 1/2	26 1/4	30	33 3/4	37 1/2

SIZE INCHES	LENGTH IN FEET					
	10	12	14	16	18	20
1 1/4 x 2	2 1/12	2 1/2	2 11/12	3 1/3	3 3/4	4 1/6
1 1/4 x 3	3 1/8	3 3/4	4 3/8	5	5 5/8	6 1/4
1 1/4 x 4	4 1/6	5	5 5/6	6 2/3	7 1/2	8 1/3
1 1/4 x 6	6 1/4	7 1/2	8 3/4	10	11 1/4	12 1/2
1 1/4 x 8	8 1/3	10	11 2/3	13 1/3	15	16 2/3
1 1/4 x 10	10 5/6	12 1/2	14 7/6	16 2/3	18 3/4	20 5/6
1 1/4 x 12	12 1/2	15	17 1/2	20	22 1/2	25
1 1/4 x 14	14 7/6	17 1/2	20 5/6	23 1/3	26 1/4	29 1/6
1 1/4 x 16	16 2/3	20	23 1/3	26 2/3	30	33 1/3
1 1/4 x 18	18 3/4	22 1/2	26 1/4	30	33 3/4	37 1/2
1 1/4 x 20	20 5/6	25	29 1/6	33 1/3	37 1/2	41 2/3
1 1/2 x 2	2 1/2	3	3 1/2	4	4 1/2	5
1 1/2 x 3	3 3/4	4 1/2	5 1/4	6	6 3/4	7 1/2
1 1/2 x 4	5	6	7	8	9	10
1 1/2 x 6	7 1/2	9	10 1/2	12	13 1/2	15
1 1/2 x 8	10	12	14	16	18	20
1 1/2 x 10	12 1/2	15	17 1/2	20	22 1/2	25
1 1/2 x 12	15	18	21	24	27	30
1 1/2 x 14	17 1/2	21	24 1/2	28	31 1/2	35
1 1/2 x 16	20	24	28	32	36	40
1 1/2 x 18	22 1/2	27	31 1/2	36	40 1/2	45
1 1/2 x 20	25	30	35	40	45	50

SIZE INCHES	LENGTH IN FEET					
	10	12	14	16	18	20
1 3/4 x 2	2 11/12	3 1/2	4 1/6	4 2/3	5 1/4	5 5/6
1 3/4 x 3	4 3/8	5 1/4	6 1/8	7	7 7/8	8 3/4
1 3/4 x 4	5 5/6	7	8 1/6	9 1/3	10 1/2	11 2/3
1 3/4 x 6	8 3/4	10 1/2	12 1/4	14	15 3/4	17 1/2
1 3/4 x 8	11 2/3	14	16 1/3	18 2/3	21	23 1/3
1 3/4 x 10	14 7/6	17 1/2	20 5/6	23 1/3	26 1/4	29 1/6
1 3/4 x 12	17 1/2	21	24 1/2	28	31 1/2	35
1 3/4 x 14	20 5/6	24 1/2	28 7/6	32 2/3	36 3/4	40 5/6
1 3/4 x 16	23 1/3	28	32 2/3	37 1/3	42	46 2/3
1 3/4 x 18	26 1/4	31 1/2	36 3/4	42	47 1/4	52 1/2
1 3/4 x 20	29 1/6	35	40 5/6	46 2/3	52 1/2	58 1/3

SIZE INCHES	LENGTH IN FEET															
	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
2 x 2	3 1/3	4	4 2/3	5 1/3	6	6 2/3	7 1/3	8	8 2/3	9 1/3	10	10 2/3	11 1/3	12	12 2/3	13 1/3
2 x 3	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2 x 4	6 2/3	8	9 1/3	10 2/3	12	13 1/3	14 2/3	16	17 1/3	18 2/3	20	21 1/3	22 2/3	24	25 1/3	26 2/3
2 x 6	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
2 x 8	13 1/3	16	18 2/3	21 1/3	24	26 2/3	29 1/3	32	34 2/3	37 1/3	40	42 2/3	45 1/3	48	50 2/3	53 1/3
2 x 10	16 2/3	20	23 1/3	26 2/3	30	33 1/3	36 2/3	40	44 1/3	46 2/3	50	53 1/3	56 2/3	60	63 1/3	66 2/3
2 x 12	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
2 x 14	23 1/3	28	32 2/3	37 1/3	42	46 2/3	51 1/3	56	60 2/3	65 1/3	70	74 2/3	79 1/3	84	88 2/3	93 1/3
2 x 16	26 2/3	32	37 1/3	42 2/3	48	53 1/3	58 2/3	64	69 1/3	74 2/3	80	85 1/3	90 2/3	96	101 1/3	106 2/3
2 x 18	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
2 x 20	33 1/3	40	46 2/3	53 1/3	60	66 2/3	73 1/3	80	86 2/3	93 1/3	100	106 2/3	113 1/3	120	126 2/3	133 1/3

SIZE INCHES	LENGTH IN FEET															
	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3 x 3	7½	9	10½	12	13½	15	16½	18	19½	21	22½	24	25½	27	28½	30
3 x 4	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3 x 6	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60
3 x 8	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
3 x 10	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
3 x 12	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120
3 x 14	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140
3 x 16	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160
3 x 18	45	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180
3 x 20	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
4 x 4	13⅓	16	18⅔	21⅓	24	26⅔	29⅓	32	34⅔	37⅓	40	42⅔	45⅓	48	50⅔	53⅓
4 x 6	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80
4 x 8	26⅔	32	37⅓	42⅔	48	53⅓	58⅔	64	69⅓	74⅔	80	85⅓	90⅔	96	101⅓	106⅔
4 x 10	33⅓	40	46⅔	53⅓	60	66⅔	73⅓	80	86⅔	93⅓	100	106⅔	113⅓	120	126⅔	133⅓
4 x 12	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160
4 x 14	46⅔	56	65⅓	74⅔	84	93⅓	102⅔	112	121⅓	130⅔	140	149⅓	158⅔	168	177⅓	186⅔
4 x 16	53⅓	64	74⅔	85⅓	96	106⅔	117⅓	128	138⅔	149⅓	160	170⅔	181⅓	192	202⅔	213⅓
4 x 18	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
4 x 20	66⅔	80	93⅓	106⅔	120	133⅓	146⅔	160	173⅓	186⅔	200	213⅓	226⅔	240	253⅓	266⅔

SIZE INCHES	LENGTH IN FEET																			
	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
5 x 5	20⅚	25	29⅙	33⅓	37½	41⅔	45⅚	50	54⅙	58⅓	62½	66⅔	70⅚	75	79⅙	83⅓	87½	91⅔	95⅚	100	104⅙
5 x 6	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125
5 x 8	33⅓	40	46⅔	53⅓	60	66⅔	73⅓	80	86⅔	93⅓	100	106⅔	113⅓	120	126⅔	133⅓	140	146⅔	153⅓	160	166⅔
5 x 10	41⅔	50	58⅓	66⅔	75	83⅓	91⅔	100	108⅓	116⅔	125	133⅓	141⅔	150	158⅓	166⅔	175	183⅓	191⅔	200	208⅓
5 x 12	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
5 x 14	58⅓	70	81⅔	93⅓	105	116⅔	128⅓	140	151⅔	163⅓	175	186⅔	198⅓	210	221⅔	233⅓	244	256⅔	268⅓	280	291⅔
5 x 16	66⅔	80	93⅓	106⅔	120	133⅓	146⅔	160	173⅓	186⅔	200	213⅓	226⅔	240	253⅓	266⅔	280	293⅓	306⅔	320	333⅓
5 x 18	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	375
5 x 20	83⅓	100	116⅔	133⅓	150	166⅔	183⅓	200	216⅔	233⅓	250	266⅔	283⅓	300	316⅓	333⅓	350	366⅔	383⅓	400	416⅔
6 x 6	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150
6 x 8	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	168	176	184	192	200
6 x 10	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
6 x 12	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300
6 x 14	70	84	98	112	126	140	154	168	182	196	210	224	238	252	266	280	294	308	322	336	350
6 x 16	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320	336	352	368	384	400
6 x 18	90	108	126	144	162	180	198	216	234	252	270	288	306	324	342	360	378	396	414	432	450
6 x 20	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500

SIZE INCHES	LENGTH IN FEET																				
	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
8 x 8	53⅓	64	74⅔	85⅓	96	106⅔	117⅓	128	138⅔	149⅓	160	170⅔	181⅓	192	202⅔	213⅓	224	234⅔	245⅓	256	266⅔
8 x 10	66⅔	80	93⅓	106⅔	120	133⅓	146⅔	160	173⅓	186⅔	200	213⅓	226⅔	240	253⅓	266⅔	280	293⅓	306⅔	320	333⅓
8 x 12	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320	336	352	368	384	400
8 x 14	93⅓	112	130⅔	149⅓	168	186⅔	205⅓	224	242⅔	261⅓	280	298⅔	317⅓	336	354⅔	373⅓	392	410⅔	429⅓	448	466⅔
8 x 16	106⅔	128	149⅓	170⅔	192	213⅓	234⅔	256	277⅓	298⅔	320	341⅓	362⅔	384	405⅓	426⅔	448	469⅓	490⅔	512	533⅓
8 x 18	120	144	168	192	216	240	264	288	312	336	360	384	408	432	456	480	504	528	552	576	600
8 x 20	133⅓	160	186⅔	213⅓	240	266⅔	293⅓	320	346⅔	373⅓	400	426⅔	453⅓	480	506⅔	533⅓	560	586⅔	613⅓	640	666⅔
10 x 10	83⅓	100	116⅔	133⅓	150	166⅔	183⅓	200	216⅔	233⅓	250	266⅔	283⅓	300	316⅔	333⅓	350	366⅔	383⅓	400	416⅔
10 x 12	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500
10 x 14	116⅔	140	163⅓	186⅔	210	233⅓	256⅔	280	303⅓	326⅔	350	373⅓	396⅔	420	443⅓	466⅔	490	513⅓	536⅔	560	583⅓
10 x 16	133⅓	160	186⅔	213⅓	240	266⅔	293⅓	320	346⅔	373⅓	400	426⅔	453⅓	480	506⅔	533⅓	560	586⅔	613⅓	640	666⅔
10 x 18	150	180	210	240	270	300	330	360	390	420	450	480	510	540	570	600	630	660	690	720	750
10 x 20	166⅔	200	233⅓	266⅔	300	333⅓	366⅔	400	433⅓	466⅔	500	533⅓	566⅔	600	633⅓	666⅔	700	733⅓	766⅔	800	833⅓

SIZE INCHES	LENGTH IN FEET																				
	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
12 x 12	120	144	168	192	216	240	264	288	312	336	360	384	408	432	456	480	504	528	552	576	600
12 x 14	140	168	196	224	252	280	308	336	364	392	420	448	476	504	532	560	588	616	644	672	700
12 x 16	160	192	224	256	288	320	352	384	416	448	480	512	544	576	608	640	672	704	736	768	800
12 x 18	180	216	252	288	324	360	396	432	468	504	540	576	612	648	684	720	756	792	828	864	900
12 x 20	200	240	280	320	360	400	440	480	520	560	600	640	680	720	760	800	840	880	920	960	1000
14 x 14	163⅓	196	228⅔	261⅓	294	326⅔	359⅓	392	424⅔	457⅓	490	522⅔	555⅓	588	620⅔	653⅓	686	718⅔	751⅓	784	816⅔
14 x 16	186⅔	224	261⅓	298⅔	336	373⅓	410⅔	448	485⅓	522⅔	560	597⅓	634⅔	672	709⅓	746⅔	784	821⅓	858⅔	896	933⅓
14 x 18	210	252	294	336	378	420	462	504	546	588	630	672	714	756	798	840	882	924	966	1008	1050
14 x 20	233⅓	280	326⅔	373⅓	420	466⅔	513⅓	560	606⅔	653⅓	700	746⅔	793⅓	840	886⅔	933⅓	980	1026⅔	1073⅓	1120	1166⅔
16 x 16	213⅓	256	298⅔	341⅓	384	426⅔	469⅓	512	554⅔	597⅓	640	682⅔	725⅓	768	810⅔	853⅓	896	938⅔	981⅓	1024	1066⅔
16 x 18	240	288	336	384	432	480	528	576	624	672	720	768	816	864	912	960	1008	1056	1104	1152	1200
16 x 20	266⅔	320	373⅓	426⅔	480	533⅓	586⅔	640	693⅓	746⅔	800	853⅓	906⅔	960	1013⅓	1066⅔	1120	1173⅓	1226⅔	1280	1333⅓
18 x 18	270	324	378	432	486	540	594	648	702	756	810	864	918	972	1026	1080	1134	1188	1242	1296	1350
18 x 20	300	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260	1320	1380	1440	1500
20 x 20	333⅓	400	466⅔	533⅓	600	666⅔	733⅓	800	866⅔	933⅓	1000	1066⅔	1133⅓	1200	1266⅔	1333⅓	1400	1466⅔	1533⅓	1600	1666⅔
22 x 22	403⅓	484	564⅔	645⅓	726	806⅔	887⅓	968	1048⅔	1129⅓	1210	1290⅔	1371⅓	1452	1532⅔	1613⅓	1694	1774⅔	1855⅓	1936	2016⅔
24 x 24	480	576	672	768	864	960	1056	1152	1248	1344	1440	1536	1632	1728	1824	1920	2016	2112	2208	2304	2400
26 x 26	563⅓	676	788⅔	901⅓	1014	1126⅔	1239⅓	1352	1464⅔	1577⅓	1690	1802⅔	1915⅓	2028	2140⅔	2253⅓	2366	2478⅔	2591⅓	2704	2816⅔
28 x 28	653⅓	784	914⅔	1045⅓	1176	1306⅔	1437⅓	1568	1698⅔	1829⅓	1960	2090⅔	2221⅓	2352	2482⅔	2613⅓	2744	2874⅔	3005⅓	3136	3266⅔
30 x 30	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000	3150	3300	3450	3600	3750
32 x 32	853⅓	1024	1194⅔	1356⅓	1536	1706⅔	1877⅓	2048	2218⅔	2389⅓	2560	2730⅔	2901⅓	3072	3242⅔	3413⅓	3584	3754⅔	3925⅓	4096	4266⅔
34 x 34	963⅓	1156	1348⅔	1541⅓	1734	1926⅔	2119⅓	2312	2504⅔	2697⅓	2890	3082⅔	3275⅓	3468	3660⅔	3853⅓	4046	4238⅔	4431⅓	4624	4816⅔
36 x 36	1080	1 29	1512	1728	1944	2160	2376	2592	2808	3024	3240	3456	3672	3888	4104	4320	4536	4752	4968	5184	5400

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